8. ECS System Management Scenario Group

The objective of the System Management Scenario Group is to demonstrate the ability of ECS system facilities and infrastructure to perform ongoing operations at the levels required for the ECS Release B upgrade. The successfully completed scenarios at each site provide assurance that the ECS Release B sites (i.e., the SMC, the EOC and the GSFC, MSFC, EDC, LaRC, NSIDC, JPL, ASF, and ORNL DAACs) are capable of conducting nominal and contingency data center maintenance and operations.

In respect to System Management, the Release B sites are tested from two viewpoints: new installations and upgrades. Both viewpoints include the verification of Level-3 requirement compliant operation of ECS components within the fully integrated ECS environment. However, the AT is conducted from an upgrade viewpoint at the GSFC, MSFC, EDC, and LaRC DAACs as Release B builds on the set of capabilities provided in Release A at these sites. Whereas, the new installation viewpoint is used to conduct the AT at the NSIDC, JPL, ASF, and ORNL DAACs as these sites receive their initial set of ECS capabilities during Release B.

Each site is examined to provide assurance to the ATT of the site's readiness to support further acceptance testing, based on the site's performance under the scrutiny of the ECS Site Commission Scenario. Since the NSIDC, JPL, ASF, and ORNL DAACs are new installation sites, their commission test consists of a more condensed and comprehensive review before receiving approval for further acceptance testing than the upgrade sites. The details of the actual commission testing for each site will be addressed in the ATPR.

The SMC Maintenance and Operations (M&O) staff members conduct enterprise monitoring and coordination of operations for ECS managed resources. The SMC interfaces with the GSFC, MSFC, EDC, LaRC, NSIDC, JPL, ASF, ORNL DAACs, and the EOC. The SMC and DAAC functional organizations use these interfaces to perform configuration management; security and accountability; and participate in system level problem resolution (trouble tickets). These functions use these interfaces to provide DAAC and EOC management access to SMC management services and system wide data. Also, the interface provides SMC staff and authorized users of SMC data access to system-wide management data.

In this scenario, the ECS capability for developing and managing integrated schedules is reviewed. The ECS system level resource and performance management capabilities are evaluated. Management and ancillary service capabilities (fault management, security functionality, network, accounting and accountability, and report generation) are reviewed for functional completeness and for acceptable operation at the sites, and in the total ECS system context. Each site's ability to accomplish and to accommodate future upgrades is also evaluated. The AT controllers test these capabilities at the level where the service meets the application.

Figure 8-1 provides a list of the System Management Group scenarios. Referring to Figure 8-1, the test activities are arranged to conduct the M&O viewer through a typical sequence of site operations events, such as site start-up, nominal operations, scheduling operations, network management, and site recovery. Subsequent inspections and demonstrations confirm site and ECS system ability to perform the Release B upgrade.

409-CD-002-001

8.1 ECS Site Commission Scenario

This scenario familiarizes an ECS M&O team with the operational sites by acquainting the staff with new ECS site procedures, and the operation and care of ECS equipment due to site installations and upgrades related to Release B. The scenario follows the M&O staff through an indoctrination of the newly installed or upgraded ECS at their site. It introduces the staff to ECS documented procedures on how each ECS site is "powered up," how various start-up and shut down activities are performed, how various upgrade procedures are handled, and how recovery from an abnormal shutdown is accomplished. It also demonstrates the types and availability of ECS maintenance tools and the application of approved procedures for their use.

The scenario evaluates ECS system level operational, maintenance, and management capabilities and the ability of the SMC to effectively integrate and provide technical and management assistance to the M&O activity. ECS site maintenance activities are reviewed and analyzed for completeness, applicability and effectiveness. Observed execution of selected maintenance activities evaluates each site's adherence to documented nominal and emergency procedures. By analysis of procedures and demonstration of selected processes, each site's basic capability to manage every-day data and information loads is assessed. System level activities for acquiring, saving and accessing archives, backup systems, data storage systems, and output products systems including generation of the ECS Project Database are evaluated. Through demonstration of simulated events and through a policy and procedures review, confidence is built in each site's ability to successfully respond to scheduled and unscheduled events.

As a final step, the acceptance test team estimates the sites' readiness to support further acceptance testing, based on the general stability and robustness of the sites performance during this condensed overview of the systems operation.

8.1.1 M&O Procedures Review Sequence

This sequence confirms the existence, readability and completeness of written computer systems M&O policies and procedures at each Release B site, including start-up and shutdown instructions, nominal operations event handling procedures and site recovery procedures that apply to partial or full, unscheduled system shutdowns. At each of the Release B sites, approved site procedures are inspected to confirm the existence and applicability of standard start-up, operations, shutdown, recovery and maintenance procedures. The NSIDC's, JPL's, ASF's and ORNL's initial activation procedures are inspected as new sites in Release B; whereas, the SMC's, EOC's, GSFC's, LaRC's, MSFC's, and EDC's upgrade procedures are inspected.

The AT review of maintenance capabilities largely consists of inspections of maintenance tools and procedures at each Release B site. Inspections confirming availability of adequate performance monitoring tools are performed. This includes procedures and tools for performing periodic testing of alternate communication capabilities to verify that they are operational.

Special SMC related M&O procedures and policies are also reviewed. The SMC is evaluated for its ability to collect, archive and distribute ECS site equipment, software and personnel operational configuration requirements, and support procedures. The SMC is also evaluated for its ability to generate, analyze and distribute system level operational directives to the operational support sites.
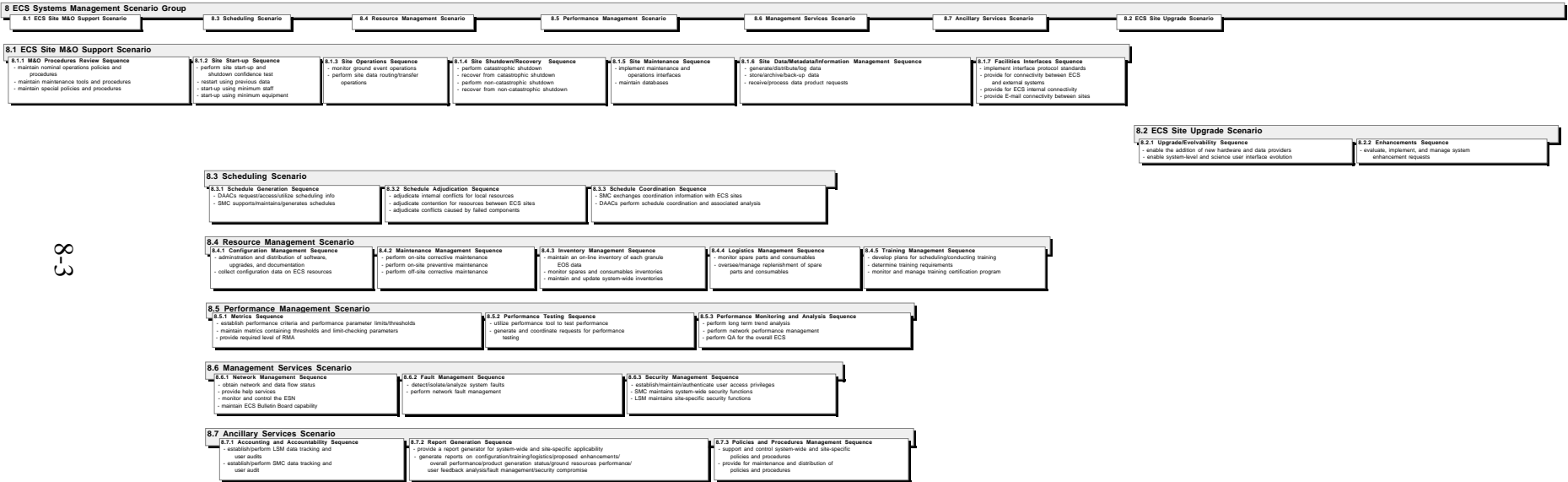
8 ECS Systems Management Scenario Group

8.1 ECS Site M&O Support Scenario	8.3 Scheduling Scenario	8.4 Resource Management Scenario	8.5 Performance Management Scenario	8.6 Management Services Scenario	8.7 Ancillary Services Scenario	8.2 ECS Site Upgrade Scenario

8.1 ECS Site M&O Support Scenario

8.1.1 M&O Procedures Review Sequence
- maintain nominal operations policies and procedures
- maintain maintenance tools and procedures
- maintain special policies and procedures

8.1.2 Site Start-up Sequence
- perform site start-up and shutdown confidence test
- restart using previous data
- start-up using minimum staff
- start-up using minimum equipment

8.1.3 Site Operations Sequence
- monitor ground event operations
- perform site data routing/transfer operations

8.1.4 Site Shutdown/Recovery Sequence
- perform catastrophic shutdown
- recover from catastrophic shutdown
- perform non-catastrophic shutdown
- recover from non-catastrophic shutdown

8.1.5 Site Maintenance Sequence
- implement maintenance and operations interfaces
- maintain databases

8.1.6 Site Data/Metadata/Information Management Sequence
- generate/distribute/log data
- store/archive/back-up data
- receive/process data product requests

8.1.7 Facilities Interfaces Sequence
- implement interface protocol standards
- provide for connectivity between ECS and external systems
- provide for ECS internal connectivity
- provide E-mail connectivity between sites

8.2 ECS Site Upgrade Scenario

8.2.1 Upgrade/Evolvability Sequence
- enable the addition of new hardware and data providers
- enable system-level and science user interface evolution

8.2.2 Enhancements Sequence
- evaluate, implement, and manage system enhancement requests

8.3 Scheduling Scenario

8.3.1 Schedule Generation Sequence
- DAACs request/access/utilize scheduling info
- SMC supports/maintains/generates schedules

8.3.2 Schedule Adjudication Sequence
- adjudicate internal conflicts for local resources
- adjudicate contention for resources between ECS sites
- adjudicate conflicts caused by failed components

8.3.3 Schedule Coordination Sequence
- SMC exchanges coordination information with ECS sites
- DAACs perform schedule coordination and associated analysis

8.4 Resource Management Scenario

8.4.1 Configuration Management Sequence
- administration and distribution of software, upgrades, and documentation
- collect configuration data on ECS resources

8.4.2 Maintenance Management Sequence
- perform on-site corrective maintenance
- perform on-site preventive maintenance
- perform off-site corrective maintenance

8.4.3 Inventory Management Sequence
- maintain an on-line inventory of each granule EOS data
- monitor spares and consumables inventories
- maintain and update system-wide inventories

8.4.4 Logistics Management Sequence
- monitor spare parts and consumables
- oversee/manage replenishment of spare parts and consumables

8.4.5 Training Management Sequence
- develop plans for scheduling/conducting training
- determine training requirements
- monitor and manage training certification program

8.5 Performance Management Scenario

8.5.1 Metrics Sequence
- establish performance criteria and performance parameter limits/thresholds
- maintain metrics containing thresholds and limit-checking parameters
- provide required level of RMA

8.5.2 Performance Testing Sequence
- utilize performance tool to test performance
- generate and coordinate requests for performance testing

8.5.3 Performance Monitoring and Analysis Sequence
- perform long term trend analysis
- perform network performance management
- perform QA for the overall ECS

8.6 Management Services Scenario

8.6.1 Network Management Sequence
- obtain network and data flow status
- provide help services
- monitor and control the ESN
- maintain ECS Bulletin Board capability

8.6.2 Fault Management Sequence
- detect/isolate/analyze system faults
- perform network fault management

8.6.3 Security Management Sequence
- establish/maintain/authenticate user access privileges
- SMC maintains system-wide security functions
- LSM maintains site-specific security functions

8.7 Ancillary Services Scenario

8.7.1 Accounting and Accountability Sequence
- establish/perform LSM data tracking and user audits
- establish/perform SMC data tracking and user audit

8.7.2 Report Generation Sequence
- provide a report generator for system-wide and site-specific applicability
- generate reports on configuration/training/logistics/proposed enhancements/ overall performance/product generation status/ground resources performance/ user feedback analysis/fault management/security compromise

8.7.3 Policies and Procedures Management Sequence
- support and control system-wide and site-specific policies and procedures
- provide for maintenance and distribution of policies and procedures

FIGURE 8-1. System Management Scenario Group Acceptance Test Sequencing

Hold for 11 x 17 back page

409-CD-002-001

8.1.1.1 Test Case B080110.010-ECS Sites Nominal Operations Policy and Procedures Review

The ECS Sites Nominal Operations Policy and Procedures Review test case is executed at each test site except SEDAC. Inputs consist of the set of written standard operations policies and procedures documentation for the site undergoing AT.

The System Administrator (SA) inspects the site's standard operating procedures for inclusion of step-by-step instructions for start-ups that are independent of previous operational states ("cold starts") and for start-ups that require re-establishment of a simulated previous operational state ("warm starts"). This test case uses the Inspection method to assure the existence and accessibility of system support procedures specifying system, facility and personnel security and safety/health requirements for system start-up and nominal operations. The SA confirms the inclusion of procedures for operations handling of every-day electronic and manual interfaces related to systems management, product generation, data archiving and distribution, and user support functions. Normal and selected abnormal shut-down procedures are inspected to confirm the existence, applicability and clarity of these procedures and their applicability to the general day-to-day operating environment. Site recovery policies and procedures are reviewed for confirmation of procedures for effectively responding to abnormal events.

A by-exception report for each site, noting any detected omissions or applicability weaknesses in the site's standard operating procedures when compared with ECS requirements, is compiled by the reviewers.

8.1.1.2 Test Case B080110.020-ECS Maintenance Tools and Procedures Review

In the ECS Maintenance Tools and Procedures Review test case, the SA reviews each site's maintenance standards for general compliance with ECS requirements. Selected maintenance schedules are compared with vendor recommended schedules for compliance using the Inspection method.

The site's standard maintenance procedures are inspected. In particular, SMC maintained tool kit configurations and supporting usage documentation are reviewed for specific ECS site applicability and for ready availability at the applicable facilities. Toolkit documentation maintained by the Local System Management (LSM) team members are reviewed for currency and effective distribution. Other site-specific LSM procedures for site maintenance are inspected for effectiveness and compliance with ECS policies.

A by-exception report for each site, noting any detected maintenance omissions or applicability weaknesses in the site's standard maintenance procedures when compared with ECS requirements is compiled by the reviewers.

8.1.1.3 Test Case B080110.030-SMC Special M&O Policy and Procedures Review

By Inspection, the SA evaluates the SMC procedures for providing mechanisms for capturing site level management data and integrating these inputs into appropriate system level management directives during this SMC Special M&O Policy and Procedures Review. SMC

procedures and cross-site standards for maintenance of the SMC configurations (such as system management procedures, science configuration maintenance directives), and SMC originated LSM procedures for maintenance of site maintenance data configurations (such as, product generation, data archiving and distribution, database recovery, and other procedures) are inspected for completeness, currency and accessibility by the SMC and site maintenance teams. SMC originated LSM procedures are evaluated to confirm procedures for implementing and maintaining awareness of SMC distributed system level management procedures, maintenance tool kits, maintenance procedures, and for maintaining communications with the SMC, including required reporting.

Inputs consist of the SMC standard operating procedures for transmitting and receiving information from ECS sites. A by-exception report for each site, noting any detected operating omissions or applicability weaknesses in the site's standard operating procedures when compared with ECS requirements, is compiled by the reviewers.

8.1.2 Site Start-up Sequence

The sequence conducts the M&O test observers through the steps required for "cold start-up" and "warm restart" of each of the sites under less than optimal conditions. Then, restart demonstrations are performed assuming preservation of previous results as part of the start-up conditions.

8.1.2.1 Test Case B080120.010-Site Start-up/Shutdown Confidence and Nominal Operations

The purpose of the Site Start-up/Shutdown Confidence and Nominal Operations test case is to demonstrate the systems ability to nominally start-up, operate, and shutdown in an orderly manner. Test input conditions include the normally configured site, in a shut-down status, but ready for nominal operations; and an applications data processing configuration that demonstrates major site Automatic Data Processing (ADP) components (computation, I/O, communications) and simulates a representative level of system loading.

At each site, the SA "powers up" the system using normal cold-start procedures. A Demonstration of a normal processing load is introduced onto the system. Successful system operation for fifteen minutes (or less if approved by the AT Test Manager) followed by execution of normal shut-down procedures concludes this test.

Real time monitoring of operations logs, displays and I/O products are used to estimate "successful" system operation. The output from this test case includes a verbal recommendation to continue (or discontinue) the AT based on observed system conditions during the test. Other post-test outputs include an inspection of hard copy logs, display images and output products. These are analyzed to confirm satisfactory nominal system start-up, shutdown and operations actions.

8.1.2.2 Test Case B080120.020-Site Restart Including Introduction of Previous Results

The Site Restart Including Introduction of Previous Results test case uses the Demonstration method to verify that each site is capable of a normal start-up when previous results are introduced. The test proceeds by introducing the previous results from the Site Start-up/Shutdown Confidence and NominalOperations test case described above into the start-up configuration and performing a system restart. The site SA monitors the system for status indicators that indicate successful introduction of the start-up conditions. Successful system operation for fifteen minutes (or less if approved by the AT Test Manager) followed by execution of normal shut-down procedures concludes this test.

Test inputs include ECS standard operating procedures for site start-up and a data set consisting from the previous shut-down. Outputs from this test include an inspection of hard copy logs, display images and output products. These are analyzed to confirm satisfactory nominal system restart, shutdown and operations actions.

8.1.2.3 Test Case B080120.030-Site Start-up Using Minimum Operations Staff Configuration

The focus of the Site Start-up Using Minimum Operations Staff Configuration test is to demonstrate that each site has the capability to Start-up using a minimum operating staff. Inputs include ECS standard operating procedures for site start-up when equipped with a minimum operating staff for start-up (as specified in the start-up procedures).

The test is conducted by having a minimum operations staff perform a system start-up. A Demonstration of normal system operation under these conditions is completed.

System outputs, such as status indicators and logs, are analyzed for confirmation of the system reaching a nominal operational status.

8.1.2.4 Test Case B080120.040-Site Start-up Using Minimum Equipment Configuration

At each site, the Site Start-up Using Minimum Equipment Configuration test is executed to demonstrate the site's start-up capability using a minimum equipment configuration as specified in the operating procedures. The SA performs a system start-up using the minimum configuration. The system is monitored for successful system operation under these conditions.

Inputs include ECS standard operating procedures for site start-up with the system in a minimum configuration for start-up. System outputs are analyzed for confirmation of the system reaching a nominal operational status under the minimum configuration. The Demonstration method is used to verify the requirements in this test cases.

8.1.3 Site Operations Sequence

The Site Operations sequence provides assurance that the SMC has the capability to support and maintain the allocation of ground event functional and capabilities to each ECS site. This

includes monitoring site schedules and executing events. The capability of manually altering the routing/transfer of data sets is also verified in this sequence.

8.1.3.1 Test Case B080130.010-Ground Operations Event

The Ground Operations Event test case confirms the ability of the SMC and each site's LSM staffs to monitor ground operations events. The SMC SA generates and sends a ground operations event, the input for this test case, to the site LSM. The site LSM staff conveys this event to the site M&O staff to which it was allocated by the SMC for execution.

The SMC is evaluated using the Test method for its ability to support and maintain priorities in scheduling ground events. The SMC and LSM are evaluated using the Demonstration method for their ability to monitor the event. The SMC database is inspected for evidence of inclusion of up-to-date, ground event allocation status, scheduling priorities, and execution status.

The output of this test is the ground event database located at the SMC. Omissions, errors and outdated event data entries, if any, are compiled as the final test output.

8.1.3.2 Test Case B080130.020-ECS Site Data Routing/Transfer Operations

The ECS Site Data Routing/Transfer Operations test case is executed at each site using the Test and Demonstration methods. The objective of the test is to confirm each site's ability to manually alter the routing of data sets to physical storage locations, and for exchanging data sets and physical volumes between ECS on-line and off-site permanent storage. This test case also confirms that each site has a data tracking system that tracks these data transports within ECS.

The test proceeds by demonstrating the specified functionality. Demonstration startup conditions include the site computer configuration in an operational state and ready to demonstrate the data routing and exchange functionality. Execution or post-test analysis discrepancies are noted and compiled as the final test output.

8.1.4 Site Shutdown/Recovery Sequence

The Site Shutdown/Recovery Sequence evaluates the site capability for requirement-compliant response to normal and abnormal site shutdown events. This sequence evaluates each site's capability for maintaining operations during abnormal situations or recovering from normal and abnormal shutdown events. The sequence consists of demonstrations of each site's ability to respond effectively to simulated abnormal events. Simulated events range from catastrophic situations, such as fire or rising water, to relatively minor, but more frequently occurring events, such as unscheduled data receipt or temporary loss of equipment or personnel resources. Tests to assure the user of the ability to obtain ECS operational status is also included in this sequence. Upon detection of a security violation, the SMC's ability to initiate and the LSM's ability to generate recovery are evaluated as required in Release B.

8.1.4.1 Test Case B080140.010-Catastrophic Emergency Shutdown

The Catastrophic Emergency Shutdown test verifies the capability of each site to respond to catastrophic emergency situations that require immediate site shutdown (such as life, or total

system threatening events) and for other types of abnormal shutdowns such as system critical equipment failure. The input for this test case is a simulated catastrophic emergency.

By Demonstration, the SA verifies this capability by simulating an emergency shutdown situation. A successful test includes the proper system response expected in these situations. The AT team notes any detected discrepancies from ECS requirements. This constitutes the final test output report.

8.1.4.2 Test Case B080140.020-Recovery From Catastrophic Emergency Shutdown

The aim of the Recovery from Catastrophic Emergency Shutdown test case is to verify that each site recovers from a catastrophic emergency shut-down. After simulating a catastrophic emergency resulting in system failure, the SA demonstrates each site's recovery procedures. The demonstration is evaluated for compliance with ECS requirements. The test includes verifying the system's integrity and the completeness of the site's data.

The system demonstration for this test case includes a simulated catastrophic emergency. Outputs consist of omissions, errors or departures from good practice noted by the AT tester.

8.1.4.3 Test Case B080140.030-Abnormal Non-Catastrophic Shutdown

The Abnormal Non-Catastrophic Shutdown test verifies the capability of each site to respond to abnormal non-catastrophic situations that require immediate site shutdown, such as system critical equipment failure. The input for this test case is a critical equipment failure.

By Demonstration, the SA verifies this capability by simulating a critical equipment failure. A successful test includes the proper system response expected in these situations. The AT team notes any detected discrepancies from ECS requirements. This constitutes the final test output report.

8.1.4.4 Test Case B080140.040-Recovery From Abnormal Non-Catastrophic Shutdown

In the Recovery From Abnormal Non-Catastrophic Shutdown test case, the SA confirms (by the Demonstration, Test, and Inspection methods) each site's ability to recover in the event of an abnormal (non-catastrophic) shutdown, such as security compromises, unscheduled data receipt, unscheduled application interruption, or site data corruption. Input test data sets and test procedures are designed to simulate the required inputs for recovery from the specified abnormal shutdown event.

After simulating an abnormal system failure resulting in data corruption, the SA performs a recovery. The system is "recovered" using the system recovery tools and backup data sets. Test execution is observed; and any abnormal operation displays, log entries or other outputs during the test execution are recorded. System outputs are analyzed for confirmation of successful system recovery and the ability to access databases is confirmed. Execution or post-test analysis discrepancies are noted and compiled.

409-CD-002-001

8.1.5 Site Maintenance Sequence

In this sequence, the AT team confirms the availability of ECS provided M&O interfaces to the DAACs to aid in maintaining the functions of system management, science algorithm integration, product generation, data archiving and distribution, user support services and system maintenance.

The AT team confirms that ECS provides database maintenance, including maintenance of an on-line guide that provides information about EOSDIS data sets. The AT team verifies that the maintenance functions include the capability to restructure the database and the capability to sustain information in the event of session interrupt and restart.

System (SMC) and cross-site standards for maintenance of the SMC configurations (such as system management procedures, science configurations, and maintenance directives), and LSM standards for maintenance of site maintenance data configurations (such as, product generation, data archiving and distribution, database recovery, and other procedures) are inspected for completeness, currency and accessibility by the SMC and site maintenance teams.

The AT team confirms the availability of tools for performing periodic testing of alternate communication capabilities to verify that they are operational.

8.1.5.1 Test Case B080150.010-Site Interface Maintenance

In the Site Interface Maintenance test case, the SA confirms, by Demonstration, that the site configurations each include M&O interfaces to aid in maintaining the functions of system management, science algorithm integration, product generation, data archiving and distribution, user support services and system maintenance. At each site, the test case also verifies that satisfactory maintenance tools are available for performing periodic testing of alternate communication capabilities to verify that they are operational.

The SA completes a series of maintenance interface actions taken from the ECS Maintenance Procedures using the available maintenance tools provided by ECS to carry out maintenance, and alter operating parameters. The effectiveness of the maintenance tools is evaluated. Upon completion of the test, the interface performance is monitored for analysis of the effectiveness of the interface maintenance.

The inputs for this test consist of a series of maintenance interface actions taken from the ECS Maintenance Procedures. The test output report consists of any issues or recommendations regarding each DAAC's implementation of these interfaces and their performance. A report on the performance of the maintenance tools is also included as output.

8.1.5.2 Test Case B080150.020-Maintenance of ECS Databases

The Maintenance of ECS Databases test case is executed at each site. The test case confirms, using the Test, Demonstration, and Analysis methods, that each LSM SA can satisfactorily store, maintain, and manage ECS databases. Other Database administration utilities for administration of on-line incremental backup, on-line recovery, and export/import of data are verified. Maintenance capabilities using ECS tools, such as restructuring the database, interrupting a

maintenance session and restart the session without loss of information, are also verified. Additional inspections are performed to confirm that internal management queries are expressed in standard query language.

The SA performs a series of maintenance activities like those mentioned above noting any discrepancies in database accessibility. Upon completion of these activities, the AT reviewer drafts a report based on the test findings.

8.1.6 Site Data/Metadata/Information Management Sequence

Each ECS site is evaluated for its ability to generate and collect, maintain and appropriately distribute cognizant data/metadata/application information, and for maintaining availability status for this information. Provisions for adequately securing data media and for suitably retaining backups of required database information are also evaluated. These functions may be performed locally, within each site or may be a part of a system-wide SMC database service. Each ECS site's ability to store, archive, and backup data is also evaluated.

This sequence evaluates ECS system and site capabilities for requirement-compliant response to normal (user scheduled data receipts, scheduled and unscheduled user requests) and abnormal (unscheduled data receipt interruptions, erroneous data receipt, erroneous operations request) system and site level events. For each site, the LSM capability for acquiring and transmitting to the SMC site data request requirements is evaluated.

8.1.6.1 Test Case B080160.010-ECS Data Generation/Distribution

The objective of the ECS Data Generation/Distribution test case is to verify the capability of each site's planning and data processing system (PDPS) to perform appropriate data and metadata generation, distribution and associated logging functions, such as capturing and exchanging management data. This test case also verifies that product thread information is accessible from the SMC, via the system database.

The test case proceeds by demonstrating the sites generation/distribution and logging functions. Demonstration start-up conditions include the site computer configuration in an operational state. Input test data sets and test procedures are designed to provide representative data sets and procedures for demonstrating site generation/distribution/ logging activities. The SA executes the specified functions using the specified procedures and data sets.

Test execution is observed and any abnormal operations displays, logs entries or other outputs during the test execution are recorded. System outputs are analyzed for confirmation of successful system recovery. Execution or post-test analysis discrepancies are noted and compiled as the final test output.

8.1.6.2 Test Case B080160.020-ECS Storage/Archive/Backup Capability

The ECS Storage/Archive/Backup Capability test case contains the activities performed by each System Operations staff to store, archive, and backup data. These activities include on-site and off-site storage as well as archive duration practices. During this test case, the SA uses all four of the test methods (Analysis, Demonstration, Inspection, and Test) to conduct various archive

and backup operations. This test case also verifies the activities performed in the management and storage of the physical backups.

Input data sets and test procedures are designed to provide representative data products for storing/archiving and for back-up demonstrations. The expected result is the successful completion of the storage operations. The outputs are the physical media containing the archives and backups. The archives and backup media are inspected for evidence to ensure that up-to-date and complete data is present. System outputs, such as status indicators and logs, are analyzed for confirmation of the system completing the functions and returning to a normal operational status.

8.1.6.3 Test Case B080160.030 - Site Data Request Management

The Site Data Request Management test case uses each of the four testing methods (Analysis, Demonstration, Inspection, and Test). These test methods are used to verify the ability of each site to handle site specific data processing requests to include actions for disposition of unscheduled or erroneous requests. Furthermore, this test case confirms each sites' capability to receive and process data product requests involving access to archived media and transmitting these and other data requests over the communications network.

The LSM SA initiates a data request from the EOC or DAACs. The evaluation confirms the availability of the system data. Real time monitoring of operations logs, displays and I/O products are used to estimate "successful" system operation. Execution or post-test analysis discrepancies are noted and compiled as the final test output. The test output report consists of any issues and recommendations regarding the site implementation of data request abilities.

8.1.7 Facilities Interfaces Sequence

This sequence verifies the basic connectivity and fundamental protocols for ECS external and internal interfaces in support of Release B operations. These tests are executed early in the acceptance testing phase, before confirming proper message content and format in the Push and Flight Operations scenario groups. The early connectivity tests provide the AT team and the Government with confidence that all ECS interfaces are ready for testing with simulated or real operational data and messages.

The ECS external interfaces and the ECS operational sites (EOC, SMC, and the DAACs at GSFC, MSFC, LaRC, NSIDC, JPL, ASF, ORNL, and EDC) for Release B are shown in Figure 7-1. Loop tests, interface simulators, and the EOSDIS Test System (ETS) are used to test the interfaces. The operational versions of external systems are used only if they are mature and available at the time needed to conduct acceptance testing on this sequence.

Confirmation that ECS external interfaces are working, including SDPF, TSDIS, EDOS, NCC, Landsat DHF, ASTER GDS, Version 0 DAACs, SCFs, FDF, and NOAA ADC, is performed through inspection of before and after data transmission products compared to requirements. Internal ECS interfaces through the EBnet, are evaluated similarly. Verification of support of the Deep Space Network (DSN), Ground Network (GN) and Space Network (SN) is performed by this sequence.

The capability to verify each ECS site's interfaces to other ECS sites is confirmed. File transfer and management functions, interoperability including binary data exchange, and approved interfaces are confirmed. The AT team confirms external ISO/OSI data communications capability specified by TCP/IP and CCSDS communications protocols and services. Site-level access via direct connection, dial-up connection, and/or network linkages are confirmed as required by each site through inspection of site-to-site test messages. Interactive capabilities, particularly between the system level database and its users, are confirmed.

8.1.7.1 Test Case B080170.010-Interface Protocol Standards

The Interface Protocol Standards test case verifies that ECS satisfies communications protocol standards as required by ECS internal and external interfaces. This test case also verifies that ECS conforms to the management architecture requirements using the Analysis and Test methods. This test case applies to the EOC, the SMC, and each DAAC.

As part of each interface test, the SA confirms ISO/OSI data communications capabilities specified by TCP/IP communications protocols, and services as required by the applicable Interface Requirements Documents (IRDs). The SA verifies that the proper hardware is being utilized as required by ECS. The evaluation is conducted using the Analysis and Test methods to verify site specific interface requirements.

The input for this test is network traffic compliant with protocol standards. As network traffic increases, the SA analyzes the ability of the ECS interfaces to meet these standards. The SA notes any execution or post-test analysis discrepancies. These are compiled into the output report. Any issues or recommendations regarding the site implementation of interface abilities are also included in this report.

8.1.7.2 Test Case B080170.020-External Interfaces

The External Interfaces test input data sets are representative samples of the actual data types to be used during normal operations of the system. The SA uses these data sets to verify the capability for each site to communicate with each of its external interfaces using the Analysis, Demonstration and Test methods. From each site, the SA performs multiple communications tests attempting to access data across site specific external interfaces.

For example, from each site assigned the capability to communicate with the ASTER GDS, the SA attempts communication by sending messages or accessing data as described in site specific communication requirements. In other words, the SA at the SMC transmits a test message to the ASTER GDS. This transmission confirms the connectivity between these two sites. Similar tests are repeated at the SMC for other interfaces and from other ECS sites.

During each part of this test case, the SA verifies that the test messages have been transmitted and checks the system indicators for any communications errors. The AT team records the results, which in a successful test reflect the error-free transfer of messages between the SMC and ASTER GDS.

8.1.7.3 Test Case B080170.030-Internal Interfaces

The Internal Interfaces test case uses representative data samples of the actual data types to be used during normal operations of the system as input.   This data uses the Demonstration, Inspection, and Test methods to verify the capability for each site to communicate with each of its internal interfaces.

From each site, the SA performs multiple communications tests attempting to access data across site specific internal interfaces. For example, from each site assigned the capability to communicate with the SMC, the SA attempts communication by sending messages or accessing data as described in site specific communication requirements. In other words, the SA at the EOC transmits a test message to the SMC. This transmission confirms the connectivity between these two sites. Similar tests are repeated at the EOC for other interfaces and from other ECS sites.

This test case verifies that the test messages have been transmitted and that the system doesn't indicate any communications errors. The AT team records the results, which in a successful test reflect error-free transfer of messages between the EOC and SMC.

8.1.7.4 Test Case B080170.040-Interface E-mail Connectivity

Using the Test method, the Interface E-mail Connectivity test case verifies the capability to exchange messages and binary data between ECS sites. The Electronic Messaging Service employed supports file transfer as well as e-mail services.

The test inputs for this test are two pair of mail accounts (mailbox) and two simple mail messages (a message and a reply). A SA creates and sends a mail message with text and binary attachments from the source mail account. Upon receipt at the destination account at another ECS site, another SA creates and sends a reply message.

During each part of this test case, the AT team verifies that the messages have been transmitted and received and compares the messages at both ends of each interface for evidence of garbling or other communications errors.

8.2 ECS Site Upgrade Scenario

This scenario traces the steps taken by M&O personnel in the process of implementing changes to the ECS site environment, especially those changes related to the Release B. It carries the maintenance personnel through established procedures for system upgrades and enhancements.

The purpose of this scenario is to provide confirmation to the test team of the SMC's, each ECS site's and the total system's ability to successfully evolve through installation of minor enhancements and major upgrades. ECS overall and site capability for ascertaining the validity and assessing impacts of requested modifications is inspected. The systems ability to analyze and approve/disapprove modification requests and effectively schedule and install approved modifications, including procedures for effective testing of approved modifications is inspected. Provisions for retaining pre-modification versions of the system plus approved procedures for re-installing these pre-modification versions are inspected.   Procedures for placing new

implementations on operational status are inspected for assurance that effective in-site and cross-site communications describing new capabilities, modified procedures, impacts from the new modification and other required special instructions are included.

This scenario confirms the ability of each ECS site to successfully provide access to additional data providers and data type services. The procedures for implementing these additions are also inspected.

8.2.1 Upgrade/Evolvability Sequence

This sequence conducts the AT reviewers through ECS systems capability for initiating, analyzing, approving, implementing and maintaining current and historical system configuration status of ECS upgrades, specifically Release B. Assurance of ECS evolvability is provided by inspection and demonstration of selected ECS architectural components for evidence of modularity, such as object oriented software practices, that indicate the ability to implement enhancements with minimal total system impacts. The SMC's ability to approve/disapprove upgrade requests and coordination of such decisions with ECS facilities and users is evaluated. The SMC's capability for maintaining a continuous active log of proposed, approved, in-work and completed upgrade requests as well as tracking, statusing and reporting on approved upgrade request activity is also confirmed.

The LSM's ability to receive, process, and report on SMC originated system and site upgrade requests is assessed. The LSM's ability to analyze and initiate system upgrade actions within their assigned sites, to coordinate with site management, and to monitor site implementation team upgrade activities are evaluated. For upgrades that involve actions by several sites, the ECS ability to analyze, approve and allocate upgrade requirements among applicable ECS sites is evaluated as well as procedures for integrating, testing and accepting inter-site upgrades.

The ability of the ECS to enable addition of new storage devices to serve discipline-unique and site-unique archiving needs, the addition of new data types, and access to configuration controlled APIs that permit development of DAAC-unique value added services is confirmed. The ECS capability to support science user development of new search methods and interactively insert these methods into the ECS system is also confirmed.

8.2.1.1 Test Case B080210.010-ECS Update/Evolvability Procedures

The ECS Update/Evolvability test case provides ECS Resource Managers (RMs) with assurance that the SMC, EOC and the DAACs (except SEDAC) have satisfactory software update, and system level evolvability procedures in place at each of these sites.

Each site's written procedures for performing software/hardware updates, procedures for managing upgrade configurations, and as-built site architecture specifications are required inputs for this test. At the SMC and the DAACs, procedures are inspected for satisfactory life cycle coverage of update initiation, implementation, and installation. Update configuration management procedures are evaluated and compared with update procedures for specification of timely reviews and baseline updates that assure the site's ability to update and retain

configuration status using each of the four test methods (Analysis, Demonstration, Inspection, and Test).

DAAC development and update team members participate in analyses to confirm, ECS's architectural and procedural capabilities for adding new data providers (e.g. DAACs, SCFs, ADCs and ODCs) as well as enabling extended provider support consisting of extended client access of data and services at SCFs and DAACs. Transportability procedures are inspected for confirmation of maximum transportability across heterogeneous site architectures and for the ability to enable addition of information search and retrieval services. The ability of each site to enable expansion to Gbyte networks including the ability to provide increased volume of data distribution/access is verified by inspection. The ability to enable extended science user provider services and to enable interoperability with international system browse and data retrieval systems is confirmed.

SMC procedures for approving/disapproving upgrade requests and coordination of such decisions with ECS facilities and users are evaluated. LSM procedures for receiving processing and reporting on SMC originated system and site upgrade directives are assessed. LSM ability to analyze and initiate SMC provided upgrade actions within their assigned sites, to coordinate with site management and to monitor site implementation team upgrade activities are evaluated. For upgrades that involve actions by several sites, the ECS policy and procedures for analyzing, approving and for allocating upgrade requirements among ECS sites are inspected as well as procedures for integrating, testing and accepting inter-site upgrades.

Analyses reports confirming the existence and suitability of the specified procedures and enabling capabilities constitute the outputs for this test case.

8.2.1.2 Test Case B080210.020-DAAC Update/Evolvability Procedures

The DAAC Update/Evolvability test case applies to each DAAC except SEDAC. This test provides DAAC RMs with assurance that the DAACs have satisfactory procedures in place for enabling future DAAC system evolution including science user interface evolution.

DAAC development and update team members participate in analyses to confirm each DAAC's architectural and procedural capability for supporting all required requests and to grow as demand expands. Each DAAC's ability to enable access to configuration controlled APIs that permit the development of DAAC-unique value added services and products is evaluated. DAAC Performance Monitors perform short and long term trend analysis of system, site, and element performance to determine the impact of potential enhancements to the system, site, or element.

Analyses reports confirming the existence and suitability of the specified procedures and enabling capabilities constitute the outputs for this test case. These reports are generated using the Analysis, Demonstration and Test methods.

8.2.2 Enhancements Sequence

This sequence conducts the reviewers through ECS site procedures for coordinating site enhancements with the ECS systems level team in support of Release B. Analysis is performed

to provide evidence that proper coordination actions with SMC takes place that update SMC retained site procedures to reflect the newly installed enhancement. SMC activities for receiving system enhancement requests to determine technical feasibility, implementation schedule, expected costs, and existing system-wide impacts are evaluated. Upon approval, the SMC's ability to manage and the LSM's ability to facilitate the implementation are evaluated.

LSM activities for receive, monitor and report on SMC originated site enhancements are assessed. LSM activities for coordinating with site management and monitoring site implementation team enhancement activities, to confirm appropriate use of integrated tool kits and standard user interfaces are evaluated.

8.2.2.1 Test Case B080220.010-ECS Enhancements

The ECS Enhancements test case is conducted at the SMC, EOC and each DAAC except SEDAC using the Analysis method. The SMC capability for maintaining a continuous active log of proposed, approved, in-work and completed upgrade requests as well as the system level procedures for tracking, stating and reporting on approved upgrade request activity is also confirmed through inspection of practices and procedures and well as review of actual log status.

The LSM RM receives an enhancement request and analyzes it to determine its validity. Once established as a valid site enhancement request, the LSM RM forwards the request to the SMC RM. The SMC RM analyzes the legitimacy of the request based on technical feasibility, expected costs, system-wide impacts, and the implementation schedule. Upon approval, the enhancement is scheduled for implementation and the SMC notifies the LSM. The site LSM M&O staff facilitates the implementation of the approved changes. The SMC provides overall management support to the implementation. Upon completion of the implementation, the SMC analyzes any user feedback information concerning the enhancement.

The AT update review team members participate in and present analyses to confirm ECS's architectural and procedural capability for expanding to include new instrument data products and algorithms in this test. Special consideration is given to evaluate the ECS ability to easily expand storage capacity and processing capability. The ECS site architectures are inspected to confirm their ability to accommodate capacity growth in all existing functions, and to enable the addition of new functions, such as tool kits. The ECS database is evaluated for its capability to assimilate new site tool kits with common interfaces and to undergo 100% expansion in both processing and storage capacity.

Analyses reports confirming the existence and suitability of the specified procedures and enabling interface are provided as output from this test.

8.3 Scheduling Scenario

The Scheduling Scenario leads a site scheduler through the process of generating a series of schedules involving that site and support by other sites. It follows the process of scheduling the activities at that site, coordinating them with other sites through the SMC and resolving scheduling conflicts as they arise. The scenario continues with the development of a coordinated master schedule by SMC operators. It carries the SMC operators through the schedule request,

development, confirmation and adjudication process; returning in full-circle to the site lead operator who initiated the schedule request.

The purpose of this scenario is to evaluate the ECS system level scheduling capability, to assess the ECS's ability to coordinate the generation of effective system level schedules, and to confirm that each ECS site's ingest, processing and output requirements are within the capabilities of the ECS system and the external users interface networks. ECS capacity for acquiring, storing and maintaining schedule related policies, negotiating and maintaining ground event functional allocations and priorities is assessed. SMC procedures for acquiring and maintaining ECS schedules, and for generating associated site-to-site integration, test, simulation, operations and maintenance directives are also evaluated.

This scenario also evaluates activities for adjudicating cross-site and cross-facility schedule conflicts in the best interests of the system's users and in a manner that promotes the most efficient use of ECS sites and the overall ECS system.

The ability to receive and analyze product generation schedules from the DAACs and other ECS sites is evaluated as well as SMC's methodology for recommending, reviewing, approving and disseminating information related to schedule implementations or adjustments. The ability to monitor the effects of schedule coordination in an operating environment is reviewed for comprehensive coverage of the entire ECS system and for realistic use of ECS site outputs. Each site's LSM scheduling activity is evaluated for its ability to communicate and receive scheduling information from the SMC as well as its effectiveness in monitoring, coordinating and implementing SMC integrated schedules within assigned sites.

8.3.1 Schedule Generation Sequence

The Schedule Generation Sequence follows the operator through the schedule generation process as implemented at each site. This sequence confirms ECS systems schedulers' capability for generating, analyzing inputs, integrating, and distributing approved system level schedules. Also, AT reviewers confirm the ability of the ECS systems schedulers to develop and communicate appropriate site schedules for instruments and ground events via e-mail.

The SMC capability for initiating, analyzing, approving, implementing and maintaining current and historical ECS system scheduling information is confirmed. This includes review of SMC abilities to ingest scheduling information related to event data processing, reprocessing, archiving and product distributing and receipt. The SMC capability for generating schedules for system level site-to-site integration, testing, simulation and maintenance activities as well as the SMC capability for generating ground resource scheduling or recommendations to FOS sites in response to emergency situations, is evaluated. Finally, the SMC's ability to monitor each site's progress based on current approved schedules is inspected.

8.3.1.1 Test Case B080310.010-DAAC Schedule Generation

The DAAC Schedule Generation test case is designed to test each DAAC's, except SEDAC's, operational capabilities in requesting, accessing and making use of scheduling information received from the SMC. The test starts with the collection of management data (test case input)

by the DAAC RM. The DAAC RM also uses time windows and priorities requested by the DAAC users. Using this management data and user information, the DAAC RM generates a schedule request with the scheduling tools provided by ECS and sends the schedule request to the SMC.

By Demonstration and Test methods, this test case verifies the DAAC capability to receive and accept schedule directives from the SMC, access system-wide scheduling information provided, and convey non-instrument related schedules for ground operations within the DAAC and other ECS sites.

Summary and detail reports issued to the SMC, and the DAAC's reaction to SMC directives are analyzed to determine the DAAC's ability to make schedule requests and to properly respond to schedule information received from the SMC. These reports and analyses are provided as output for this test.

8.3.1.2 Test Case B080310.020-SMC Schedule Generation

Using the Demonstration and Test methods, the SMC Schedule Generation test case verifies SMC capabilities to support, maintain and generate data transmission and acquisition schedules, to support conflict resolution, and to respond to emergency situations. The test case verifies SMC capabilities to provide schedule directives to DAAC sites in response to simulated status and coordination data received by the SMC.

A DAAC RM sends a cross-DAAC process dependency situation simulating the need for system wide scheduling from the SMC. The SMC RM analyzes the scheduling information provided from the DAACs and recommends adjustments resulting from the cross-DAAC dependencies. Then, the SMC RM transmits the recommended schedules and directives on implementing the schedule to the DAACs involved.

The scheduling reports generated and directives issued are analyzed to determine SMC's ability to properly schedule and re-schedule ECS sites. The reports and analyses are provided as output for this test case.

8.3.2 Schedule Adjudication Sequence

The Schedule Adjudication Sequence conducts the reviewer through the ECS schedule adjudication process. The ECS systems scheduler's ability to detect, analyze, adjudicate, and distribute decisions; and monitor actions resulting from schedule conflicts is confirmed at each site. Each ECS site's ability to respond to contingencies and scheduling problems is evaluated.

The SMC's ability to determine conflict resolution based on proposed schedule change acceptance or rejection, and based on comparison with current master schedules maintained within the SMC is inspected. The SMC capability for distributing schedule adjudication results is assessed based on comparison with ECS requirements. The SMC's ability to identify cross-site schedule dependencies and its ability to analyze, adjust master schedules, and recommend adjustments to product generation schedules are tested for consistency and equitable treatment based on system level priorities, product generation requirements and total system operating efficiency.

This sequence also verifies that, in the event of scheduling conflicts, notification including identification of the conflicting activities and the source conflict is provided to the elements involved.

8.3.2.1 Test Case B080320.010-Adjudication of Internal Site Contention

The purpose of the Adjudication of Internal Site Contention test case is to verify LSM requirements to perform conflict-resolution in response to schedule or resource contention between internal applications at individual ECS sites. This test case simulates a conflict between the demand for local resources expressed by a series of local batch and on-line applications. The test case verifies LSM resource contention detection and adjudication capabilities to support science users who submit batch and interactive work through workstations at the site using the Demonstration and Test methods.

Users request site resources which cause a resource contention problem. The resource contention problem is created and the LSM is called into play to resolve the conflict. An adjudication process is established by the LSM RM resulting in the assignment of the resources under contention to the application with the highest priority. The LSM then notifies all applications of the conflict resolution action. The requester is also notified of the resolution action and status.

At the completion of the test, the actions taken by the LSM are inspected for conformance with the resource contention handling procedures.

8.3.2.2 Test Case B080320.020-Adjudication of External Contention Between Sites

The Adjudication of External Contention Between Sites test case verifies SMC requirements to resolve contention for resources between ECS sites. Using the Demonstration and Test methods, this test case verifies SMC requirements to perform analysis and conflict resolution in response to problems associated with ECS ground event schedules or abnormal service delays between sites. It verifies that the adjudication process is executed between ECS sites and it verifies that message and data communications comply with ECS site-to-site requirements.

Simulated ECS ground event problems or resource contention problems are initiated at each connection between the DAACs, EOC, and SMC. The simulations introduce abnormal response times for a remote site's access to ECS archived products, user services or repository of ECS status information. DAAC RMs issue notifications to the SMC RM in response to unsatisfied site access requests. The SMC RM uses the adjudication process supported between the SMC and ECS DAACs. The SMC RM uses conflict identification, performance analysis, and policy and procedure's services to support the conflict resolution process. Then, the SMC RM recommends a resolution to the DAAC.

The SMC produces summary and detail report(s) identifying the extent of the conflict. The report delineates the cause of service delays and processing dependencies associated with the service request. The SMC produces proposed solutions along with a schedule for implementation for each conflict resolution. At the completion of the test, the reports produced

and actions taken by the SMC are inspected for conformance with the resource contention handling procedures.

8.3.2.3 Test Case B080320.030-Adjudication of Contention Caused by Failed Subsystem Components

The Adjudication of Contention Caused by Failed Subsystem Components test case applies to each DAAC except SEDAC. ECS requirements to perform analysis and conflict resolution in response to schedule or resource contention between DAAC subsystem components are verified in this test case using the Demonstration and Test methods. Furthermore, this test case verifies that conflicts are identified and corrective action initiated for partitions of ECS functions in a DAAC site. Resource or schedule conflicts result in a notification of resource contention being posted by the LSM RM. Resource or schedule conflicts are caused by failed operation of site hardware, delayed access to archived data, improper execution or performance of system software, and improper execution or performance of application level software.

A series of hardware faults are simulated at an ECS site where fault management services isolate the fault and configuration management services support replacement of failed equipment. The LSM RM is called into play where subsystem schedule and resource conflicts are identified and resolved where possible. During this process, the LSM RM responds to unsatisfied service request notifications, conflict resolution request messages, data server conflict alerts, and user authentication requests. Upon completion of the analysis the LSM RM provides a recommendation for an interim resolution until the failed components are recovered.

At the completion of the test, the actions taken by the LSM RM are inspected for conformance with the resource contention handling procedures.

8.3.3 Schedule Coordination Sequence

The Schedule Coordination Sequence evaluates SMC systems schedulers' ability to produce and distribute coordinated schedules to ECS sites. The SMC is evaluated for its ability to receive product and event generation schedules from the relevant sites. Sites are evaluated for their ability to coordinate recommended schedule adjustments with other affected ECS sites. After final adjustments are included, inspection confirms each site's ability to distribute final adjustments to the affected sites for implementation. The acceptance test process assesses SMC procedures for monitoring and assuring that adjustments are implemented as specified.

The AT reviewer verifies each LSM's ability to provide each site with access to system-wide scheduling information. The access to such information as instrument and ground event scheduling, other site's plans and schedules, and product thread information is also verified. The AT reviewer also verifies the LSM M&O staff's ability to communicate scheduling information to the SMC.

8.3.3.1 Test Case B080330.010-SMC Schedule Coordination

The objective of the SMC Schedule Coordination test case is to verify the SMC capabilities to perform ECS coordination activities to support the missions. By the Test and Demonstration

methods, this test case examines the overall coordination of ECS scheduling activities at the SMC. This test case also verifies the ability of the SMC to access scheduling and status information provided by the DAACs.

Using DAAC scheduling and status information as input, the SMC RM attempts to access this information from the various DAAC locations in coordination with the DAAC RMs. The SMC RM then uses the scheduling tools provided by ECS, analyzes the information and generates schedules. The generated schedules are then stored in the SMC scheduling database. Output for this test case consists of the SMC scheduling database.

8.3.3.2 Test Case B080330.020-DAAC Schedule Coordination

The DAAC Schedule Coordination test case uses the SMC database as input to verify that the DAACs and the EOC have the capability to perform schedule coordination and associated analysis necessary for the support missions. Inputs to this test case also consist of requests for initial product and event schedules from SMC; adjusted schedule ground event and product generation schedules from SMC; ESDIS policies, procedures and directives; local SMC product generation schedules, DAAC trend analysis and applicable aspects of DAAC performance monitoring and analysis reports. This information is stored in the SMC scheduling database.

Using the Analysis, Demonstration, and Test methods, the DAAC RM attempts to access the SMC scheduling database to obtain element allocations for ground event functions, product thread information, scheduling directives, and other plans and schedules. The expected results of this test case are the successful attempts to access the information provided in the database. These test results are inspected for compliance with expected results.

8.4 Resource Management Scenario

This scenario carries the site M&O staff through the process of performing ECS resource management. It traces the operations staff through the processes related to hardware and software configuration, maintenance, inventory, and logistics, as well as the training of human resources at the SMC, EOC and DAACs.

This scenario conducts the reviewers through the ECS capability for performing system level configuration management. Both SMC and LSM configuration management functions and procedures are confirmed. The coordination and movement of resources between ECS sites are evaluated. The SMC team's ability to interface with site LSM points-of-contact are analyzed to confirm the ability to coordinate and effect integrated hardware and systems software maintenance activities including management of on-site and off-site corrective and preventive systems hardware maintenance and monitoring off-site repair activities.

SMC/LSM logistics management activities are assessed for their combined ability to monitor and communicate information concerning spares and consumable inventories and replenishment. The AT team evaluates the effectiveness of system training management including the quality of SMC support and the LSM's ability to coordinate training issues between the LSM assigned site and the SMC. The completeness, effectiveness and the degree of comprehensives of the ECS capability for performing system-wide inventories including evaluation of previous or on-going

inventory procedures is assessed. The quality of SMC/LSM/site coordination of inventory management administration is evaluated. SMC activities regarding management of system enhancement requests are included as a part of inventory management.

8.4.1 Configuration Management Sequence

This sequence conducts the reviewer through ECS configuration management activities for providing system level information, equipment and software resources to ECS sites. The sequence, in effect, confirms the existence of system-wide and site automated configuration management for ECS operational hardware, software and tool kits. The AT review of the configuration management system includes the support of migration of hardware and software upgrades into the operational environment.

The sequence evaluates the ECS on its ability to maintain control over configured systems and the upgrades to them. It ensures that configuration management actions are properly documented and verifies the existence of a configuration management database containing system configuration histories as well as their current status. Also, the AT evaluations include assessment of the EBnet management capability for providing control of network configuration parameters and resources.

8.4.1.1 Test Case B080410.010-Resource Distribution

The Resource Distribution test case investigates the SMC's ability to automate distribution of all unlicensed tool kit software, upgrades and documentation to authorized users. Also, this test case investigates the SMC's ability to distribute licenses for deployed commercial-software funded by the ECS contract. This test case uses the Demonstration and Inspection methods.

At the SMC, the RM reviews the documentation for distributing system software. The RM demonstrates the SMC's automated distribution system using an approved as input. The is provided to an authorized user as directed by the automated distribution system. The expected results are the successful distribution of the software, upgrades and documentation. At the completion of the test, the actions taken by the LSM RM are inspected for conformance with expected results.

8.4.1.2 TestCase B080410.020-SMC/LSM Configuration Management

The SMC/LSM Configuration Management test case verifies that the SMC can provide system wide configuration management capability. The LSM's capability to perform these functions for its own site is also confirmed. The Analysis, Demonstration, and Test methods are used to verify these capabilities. This test case is performed at the SMC, EOC, and each DAAC.

At the SMC and each LSM, the Configuration Manager (CM) reviews the documentation for maintaining the inventory of hardware, science software, and system software on a system wide and site-specific basis, respectively. The CM uses this information to bring up and access the database containing configuration management information for hardware. For each site, database information pertaining to one hardware item is recorded. The CM inspects the identification numbers, manufacturer, part number, and serial number of the actual hardware

item and records this information. An inspection of the selected hardware is performed at each center, and the CM records the results.

At each site, the CM compares the database information with results of the hardware inspection. A successful test results in no discrepancies between the information contained in the database and the actual items selected for inspection or between information contained in the database at the SMC and the database at each site. Additionally, the CM makes an assessment of the SMC and LSM inventory and configuration management documentation, which in a successful test are complete and accurate for accessing and monitoring the database. The procedures also describe the actions to be taken in the event of a discrepancy between physical inventories and the information contained in the configuration management system.

8.4.2 Maintenance Management Sequence

This sequence illustrates to the reviewer the ECS capabilities for managing system level maintenance activities, personnel, and the automated resources in performing on-site and off-site preventative and corrective maintenance activities. The AT team inspects the system level maintenance management database containing historical, current and planned schedules, resource commitments and budgets pertaining to system level maintenance management.

This sequence confirms the SMC capability for providing system level assistance in managing site level maintenance activities, including personnel skills, multi-site use maintenance tools and system level maintenance software tool kits. The LSM's ability for monitoring, statusing and reporting to the SMC on LSM activities is also analyzed.

8.4.2.1 Test Case B080420.010-On-site Corrective Maintenance

The On-site Corrective Maintenance Management test case is executed at each of the sites. Using the Analysis, Demonstration, and Test methods, this test case verifies the SMC and LSM RM's ability to provide on-site corrective maintenance support. A corrective maintenance event is used as input for this test.

The LSM RM monitor site resources to determine the operational state of the resources. Upon detection of the "Failed" state of a site resource, a LSM Technician opens a Trouble Ticket (TT). The LSM Technician attempts to perform corrective actions as directed. In the event that assistance is required to complete the corrective actions, the LSM Technician notifies the Maintenance Manager. In the event the problem cannot be resolved by LSM personnel, the Maintenance Manager informs the SMC of the situation. At this point, the SMC staff dispatches SMC Technicians to provide assistance to the LSM at the site. Upon completion of the troubleshooting procedure, both SMC and LSM technicians update the maintenance database with information on the diagnostic tests performed, results obtained, corrective action taken, and the current maintenance status; thus, closing the TT.

The expected results are the satisfactory correction of the problem. Diagnostic and corrective action reports are then generated using the database and analyzed to determine the effectiveness of the maintenance provided. At each site, the Maintenance Manager compares the database information with the expected results of the repair.

8.4.2.2 Test Case B080420.020-On-site Preventive Maintenance

The On-site Preventive Maintenance test case verifies the SMC and LSM RM's ability to provide on-site preventive maintenance support at each site. Preventive maintenance is scheduled well in advance of its occurrence. Preventive maintenance schedules (historical, current, and planned) are used as input for this test. This test case uses the Analysis and Demonstration methods.

The LSM Scheduler receives scheduling directives from the SMC Scheduler. In the event a preventive maintenance action is scheduled, LSM RM notifies the effected users prior to the maintenance occurring of any user services that may be affected during the preventive maintenance period. The users are also informed of the estimated duration of the preventive maintenance period. The LSM RM coordinates with site staff to minimize the disruption of user services. After user notification, the LSM RM perform the scheduled maintenance at the scheduled time at the site. In the event the scheduled preventive maintenance action requires SMC assistance, the SMC staff coordinates the maintenance duties between themselves and the LSM staff. Then, the SMC staff dispatches technicians to provide assistance in performing the actions to the LSM.

Upon completion of the maintenance procedure, the SMC and LSM RMs update the maintenance database with information on the preventive action taken and the results obtained. Preventive action reports are then generated by the database and analyzed to determine the effectiveness of the maintenance and assistance provided.

8.4.2.3 Test Case B080420.030-Off-Site Corrective Maintenance

The Off-Site Corrective Maintenance test case confirms the ability of the SMC and LSMs to coordinate off-site corrective maintenance management for each site. The input for this test is a corrective maintenance event resulting in off-site repairs. The test is verified using the Analysis, Demonstration, and Test methods.

The SMC and LSM RM monitor site resources to determine the operational state of the resources. Upon detection of the "Failed" state of a site resource, a LSM technician opens a TT. In the event that the equipment cannot be repaired on-site, the LSM technician identifies it for off-site repair and updates the TT. The LSM Maintenance Manager sends the component to the appropriate vendor and records repair information into the database. This information includes a description of the problem, name of repair contractor, date sent to repair facility, estimated time of repair and cost.

The SMC tracks the maintenance coordination process conducted by the LSM RM. During this test, the SMC RM's ability to monitor hardware and software maintenance status for off-site repair actions is also confirmed. The SMC RM must be capable of monitoring off-site repair actions on a system-wide and site-specific basis. The monitoring procedures include identifying system-wide or local vendor repair problems and maintenance trends, such as an unusually high repair rate for certain equipment. The SMC RM notes any significant information pertaining to the repair of the component and logs it into the database.

After the item has been repaired and returned, updated information, such as repairs made, actual cost of repair and time of repair, is also recorded. The information is used for analyses purposes

to include assessments of turn-around time, spare status, and maintenance trends. Software problems are addressed in accordance with approved configuration management procedures. Information including a description of the problems and their status is recorded in TTs and made available to site and SMC staffs.

Diagnostic and corrective action reports are then generated using the database and analyzed to determine the effectiveness of the maintenance provided. At each site, the Maintenance Manager compares the database information with the expected results of the repair.

8.4.3 Inventory Management Sequence

This sequence provides the methodology for reviewer inspection of ECS capabilities for establishing and maintaining inventory databases. The reviewer methodology includes inspection of participating and contributing system level skills and resources in performing site level inventory activities. For Release B, this sequence confirms the automated ability of ECS to receive, store, control, and ship ECS spares, repair parts, and consumables received at or shipped to each ECS site. This sequence also verifies the ECS ability to plan, establish and maintain a system-wide inventory of all hardware, scientific and system software and associated documentation within ECS.

8.4.3.1 Test Case B080430.010-Data Inventory

The Data Inventory test case is performed at the SMC to verify the existence of an SMC inventory database containing information on each granule of EOSDIS data. The Analysis and Test methods are used to verify this test. Also, the SMC inventory database is used as input for this test case.

At the SMC, the Database Administrator (DA) establishes, maintains, and updates the data inventory database to include information on data identifications, purposes, locations, classifications and priorities. The DA performs an inspection of selected data. The DA compares the database information with results of the data inspection.

A successful test results in no discrepancies between the information contained in the data inventory database and the actual items selected for inspection. The DA notes any detected discrepancies from ECS requirements. This constitutes the final test output report.

8.4.3.2 Test Case B080430.020-Spares and Consumables Inventory

The Spares and Consumables Inventory test case is performed at each of the sites to verify the existence of an inventory database containing resource information on spares and consumables. The Demonstration method is used to verify this capability. Also, the spares and consumables information is used as input for this test case.

As spares and consumables are purchased, RMs log information on the resource into the Spares and Consumables Database. This information includes item identification and location. In the event that these spares and consumables become operational, the RM updates the information in the database to denote the use of the resource.

The SMC RM tracks the spares and consumables usage and coordinates resource usage in the event a spare or consumable is needed at a site other than its stored location. During this test, the SMC and LSM RM's ability to monitor spares and consumables is also confirmed. The SMC RM monitors these resources on a system-wide and site-specific basis. The LSM RM performs an inspection of selected spares and consumables. The LSM RM compares the database information with results of the inspection. The LSM RM notes any significant information pertaining to the spares and consumables status and logs it into the database.

A successful test results in no discrepancies between the information contained in the Data Inventory and the actual items selected for inspection. Successful results also include matching information in the SMC and LSM databases. The DA notes any detected discrepancies from ECS requirements or departures from good practice. This constitutes the final test output report.

8.4.3.3 Test Case B080430.030-System-Wide Computer Inventory

Using the Test method at each site, the System-Wide Computer Inventory test case verifies the capability for ECS to update the System-Wide Computer Inventory Database. The LSM RM reviews the documentation for updating the inventory database for hardware and software. The LSM RM uses this information to update the System-Wide database of all hardware and software contained within its element. The LSM RM brings up and accesses the database. Database information about one hardware item is recorded.

The LSM RM notifies the SMC RM that one hardware item has replaced another on the operational system. The LSM RM provides the identification number, manufacturer, part number, and serial number of the new hardware item and changes the database to reflect the new hardware configuration. A similar set of events is repeated for software. Additionally, software dates, version numbers, and the name and location for software maintenance are substituted for hardware manufacturer, part number, and serial number.

Throughout this test case, the SMC RM compares information with LSM RM and records the results noting any discrepancies and deficiencies. The SMC RM also compares information from the databases generated at the SMC with the corresponding information generated at the site.

8.4.4 Logistics Management Sequence

This sequence reviews ECS capabilities for managing system level logistics management and replenishment activities and for managing system level personnel and resources in logistics control activities. The AT team inspects the ECS ability to develop and update a system level logistics management database containing historical, current and planned logistics commitments. This sequence verifies the automated capabilities of the SMC to specify site level logistics activities in assisting and providing system level skills and resources to assist in site level logistics functions, including personnel skills, logistic management tools and system level logistics related tool kits. Also analyzed in this sequence, is the capability of the LSM at each site to apply available SMC resources within their assigned facilities.

8.4.4.1 Test Case B080440.010-Replenishment

The Replenishment test case confirms that the SMC has the capability to oversee and the LSM has the capability to manage the replenishment of spare parts and consumable items. The Demonstration and Test methods are used to verify these capabilities. This test case is performed at each site.

The SMC and LSM RMs track spare and consumable usage and coordinate resource usage using the ECS resource management tools in the event a spare or consumable is needed at a site other than its stored location. In the event that stock levels fall below established reorder points, the LSM RM alerts the SMC that the current quantities of consumable items, such as computer tapes, computer disks, and computer paper, have fallen below their respective reorder points at its center by generating a warning message describing the shortfall in resources. The LSM RM brings up the database at his/her site and changes the current quantities of these items accordingly. In the case of the SMC, the RM records this information for all sites. The RM at each site follows the logistics replenishment procedures as directed by the SMC and changes the database to reflect the increased quantities of items. At the SMC, this information is recorded for each site.

Throughout this test case, the AT team records any alert or warning messages, compares simulated actions to procedures, and records the results, noting any discrepancies and deficiencies. The AT team also compares the information gathered from the database at each site with that gathered at the SMC. In all successful cases, the database at the SMC reflects the same information as that contained in the corresponding LSM databases.

8.4.5 Training Management Sequence

This sequence inspects the methodology for reviewer inspection of ECS capabilities for managing system level training and for supplying system level personnel and courseware. The AT team inspects the established database architecture to confirm the SMC's ability for developing and updating a system level training management information base containing historical, current and planned schedules courseware availability, training commitments and budgets pertaining to system training activities.

The AT evaluation includes a review of the SMC's ability to provide system level assistance in managing site training and providing system level skills and resources to assist in site level training and courseware development, including personnel skills, multi-site training tools and system level training courseware tool kits. The LSM, at each facility, is inspected to confirm the abilities to monitor, provide status and report to SMC on LSM activities and to apply available SMC training resources within their assigned facilities.

8.4.5.1 Test Case B080450.010-Training Management

The Training Management test case verifies the ECS SMC ability to monitor and manage the ECS training certification programs. This test case also confirms the ability of the LSM training staff to coordinate with the SMC in managing the training programs. OA tools assist the SMC training staff in tracking resources for training. The Demonstration and Analysis methods are

used to verify that the OA tools support the management of training and certification programs for the ECS.

Using the training programs as input, the SMC Training Manager accesses the ECS on-line training database to assist the SMC Training Manager in the organization and management of ECS training. The SMC Training Manager uses the database to schedule dates of training courses, training resources (system equipment, software, instructional materials), and personnel to support training. The ECS training database is updated with all of the scheduling information and formatted into a Training Schedule Report. This report is disseminated to the LSM Training Manager via the ECS training bulletin board as the proposed training schedule. After review and consideration by the site managers, the SMC Training Manager finalizes the training course schedule and makes it available via the ECS training bulletin board. Training registration is done by e-mail. A confirmation of all training registration applications is transferred via e-mail.

8.4.5.2 Test Case B080450.020-ECS Training Certification Program Development

The Training Certification Program Development test case verifies the Office Automation (OA) tools used by the SMC training staff in determining training requirements for various operator positions and maintaining training course information to support the development of training courses. The Demonstration, Inspection and Test methods are used to verify that the OA tools support the management of training certification programs for the ECS. The training requirements for various operator positions are used as input for this test.

The SMC training staff accesses the Certification Skills Catalog to identify the tasks and knowledge required to effectively perform each specific DAAC ECS operation and to determine training requirements for the operator, maintenance engineer and software sustaining engineer positions. The LSM training staff then contacts each DAAC's site ECS managers, via e-mail, to obtain information on the personnel training needs, the number of people requiring training, and any site unique training requirements. This information is collected and stored in the ECS on-line training database by the LSM training staff to assist the SMC training staff in the organization and management of ECS training.

Once all of the information from the DAAC site ECS managers have been entered into the training database during the previous test case 8.4.5.2 Training Management, the SMC training staff uses the information to support the development of training courses. After review and consideration by the site managers, the SMC training staff finalizes the training courses. The training courses' effectiveness is evaluated and a report of the findings is produced as output for this test case.

8.5 Performance Management Scenario

This scenario walks site operations personnel through the process of accessing and displaying system performance parameters and metrics. It carries the staff through a series of analytical and diagnostic sequences which demonstrate the system's capability to measure ECS performance and detect operational trends.

System level alert indicators or other alarm communications are demonstrated and evaluated for operational effectiveness. The ability to perform relevant performance tests using system level tools is assessed, as well as the ability to create and distribute performance test results, accompanying analysis and recommendations.

Performance monitoring testing includes assessment of the SMC/LSM to effectively perform trend analyses at both the system and site levels and to analyze the results of this monitoring effort. Also, the site LSMs are evaluated for their procedures and proficiency in implementing SMC performance directives and evaluating site performance against established ESDIS performance criteria.

ECS system level quality management is evaluated for its ability to assess overall ECS performance within the SMC, for effective SMC/LSM coordination, and for satisfactory LSM quality assurance procedures and software.

8.5.1 Metrics Sequence

This test sequence verifies the capability of the SMC to evaluate overall ECS system performance, for the broad spectrum of activities required for Release B, including data collection and delivery, product generation, and responses to user requests, Targets of Opportunity (TOOs), and emergencies. Also verified is the SMC capability to establish and maintain system level metrics containing thresholds and multiple level limit checking parameters. Also tested is the SMC's ability to generate, maintain, and update performance criteria and responses to performance deficiencies, for the system and the sites. Similar capabilities for the LSM are confirmed, including the ability to implement SMC performance criteria and limits testing, using SMC database metrics for comparison. The capability of the ECS to provide the required availability of key services and to be able to switch over or repair failed capabilities within specified Mean Down Times (MDTs) is also confirmed. Finally, the SMC and the LSM capability to generate alert indicators for fault and degraded conditions is confirmed.

8.5.1.1 Test Case B080510.010-Performance Metrics Establishment

The Performance Metrics Establishment test case verifies the capability of the SMC and the LSMs to establish, maintain and update system performance criteria and performance parameter limits and thresholds. The capability to establish multiple threshold levels, including on/off, pass/fail, and various levels of degradation is also confirmed. These thresholds provide a mechanism for statistically monitoring both the raw and corrected bit error rate of storage media in the archive as well as the active performance of the overall system.

The Analysis, Demonstration, and Test methods are used to verify these capabilities. Required test case inputs include a list of ESDIS specified performance parameters, specifications, and policies and procedures. The Performance Manager (PM) exercises different levels of performance including peak loads to assess the capability to update and check limit and threshold parameters using HP OpenView. The PM collects performance data during various system activities, such as product generation, reprocessing, and response to user requests.

Expected results include the verification of the ability of the SMC and the LSMs to establish, maintain and update system performance parameters and limit thresholds. The capability to monitor performance and to evaluate performance and any degradation with respect to these parameters is confirmed.

8.5.1.2 Test Case B080510.020-RMA Assurance and Analysis

The purpose of the RMA Assurance test case is to verify the capability of the ECS to provide services with required reliability, maintainability and availability (RMA). It also confirms the capability of the ECS to correct faults and to restore system capabilities within specified times. The RMA of the ECS conforms to GSFC 420-05-03, Performance Assurance Requirements for the EOSDIS. ECS maintainability provides predictions in accordance with MIL-HDBK-472, Maintainability Prediction, Procedure IV and MIL-HDBK-217F, Reliability Prediction of Electronic Equipment. The Table 8-1 below summarizes key availability and maximum Mean Down Time (MDT) requirements for specific ECS services verified by this test case.

Table 8-1. RMA Capabilities

ECS Segment	ECS Function or Service Provided	Minimum Availability/Maximum MDT
Overall	System-level Functions and Services	0.96/ 4 hrs.
SDPS	Receiving Science Data	0.999/ 2 hrs.
SDPS	Archiving and Distributing Data	0.98/ 2 hrs.
SDPS	User Interfaces to Information Management System (IMS) Services at DAAC Sites	0.993/ 2 hrs.
SDPS	Information Searches on the ECS Directory	0.993/ 2 hrs.
SDPS	Metadata Ingest and Update	0.96/ 4 hrs.
SDPS	Information Searches on Local Holdings	0.96/ 4 hrs.
SDPS	Local Data Order Submission	0.96/ 4 hrs.
SDPS	Data Order Submission Across DAACs	0.96/ 4 hrs.
SDPS	IMS Database Management and Maintenance Interface	0.96/ 4 hrs.
SDPS	Product Generation Capability (Each Computer)	0.95/ N/A
SDPS	Data Acquisition Request Submittal	0.993/2 hrs.
CSMS	SMC Capability to Gather and Disseminate System Management Information (for critical services)	0.998/ 20 min.

This test case also confirms that the maximum down times are less than or equal to twice the required MDTs in 99% of failure occurrences and that the primary science data receipt mean switchover time to a backup capability is 15 minutes or less. A combination of Analysis, Demonstration, and Inspection are used to confirm this and the above service availabilities and

service restoration times. Test case inputs needed include reliability data and repair specifications for key ECS components, switchover time estimations, in-the-field maintenance records and demonstrations by the M&O staff of repair and switchover procedures for various failure occurrences.

Expected results include confirmation that the ECS can make needed services available as required and can repair or switchover from failed capabilities within specified MDTs.

8.5.2 Performance Testing Sequence

This sequence guides the reviewer in confirming the SMC's and each LSM's capability to generate, as needed, requests for performance testing including resources to be tested, test purpose, requested test environment, impacts to operations and expected results. This evaluation includes confirmation and review of the SMC performance test tool and evaluation of SMC and LSM personnel resources to determine the ability of the system and site test teams to respond to specific testing requests.

8.5.2.1 Test Case B080520.010-Performance Test Tools

The Performance Test Tools test case confirms that the ECS performance test tool supports overall ECS system performance as well as network performance testing. This test case applies to the SMC, EOC and each DAAC.

Using the Demonstration and Test methods, the PM utilizes the capabilities of the performance test tool as the primary method for testing overall system-level and EBnet performance capabilities. The suite's graphical user interface (GUI), database, and data collection, i.e., performance statistics, capabilities are confirmed. The PM observes and records the behavior of the performance test tool suite, particularly with respect to its interface to data stores and its ability to transport supporting data to and from subsystems within each ECS site.

8.5.2.2 Test Case B080520.020-Performance Test Request

Using the Demonstration and Test methods, the PM verifies that the SMC and LSM have the capability to generate and coordinate requests for performance testing in the Performance Test Request test case. The PM also evaluates the SMC's and LSM's ability to respond to testing requests at each site.

At each site, performance testing requests are simulated. The applicable site LSM PM executes the steps necessary to request the time and resources needed to accomplish the specified performance testing. During this process, the LSM PM coordinates with the SMC. Databases containing resource scheduling information for performance testing are updated, as required.

For system-wide performance testing, a performance testing request involving all ECS sites is generated. The SMC PM coordinates with the LSM at each site and external interfaces. The SMC PM also updates resource scheduling databases with performance testing criteria.

The SMC PM observes the actions of the LSM PM and compares them with procedures, noting any deficiencies and discrepancies. Each database that is updated reflects the same information

at both the SMC and LSMs at the applicable site(s). These are also compared and analyzed. The expected results are comparable actions and database contents.

8.5.3 Performance Monitoring and Analysis Sequence

This sequence guides the reviewer in inspecting system and site capabilities for performing, analyzing and reporting on short and long term performance trend analyses of system and site operational status, specific resource performance and maintenance activities. The SMC's performance management team procedures monitoring system uses site hardware and software to determine that their operational states (on-line, failed, in maintenance mode, test mode, or simulation mode) are inspected. The AT team inspects and confirms the methodology for evaluating system and site database performance parameters against established thresholds including, performance in logon authorization, directory search, guide search, inventory search, account or request status checking, data browse, document search, and order services. Furthermore, this sequence verifies ECS's ability to predict and periodically assess maintainability.

8.5.3.1 Test Case B080530.010-Performance Monitoring and Analysis

The Performance Monitoring and Analysis test case verifies the capabilities of the SMC and LSM to use performance management tools to augment overall system management activities for all ECS resources and personnel. This test case applies to the SMC for the overall ECS capability, and to the LSM for each DAAC and the EOC.

The SMC and LSM PM observes and acquires trend information reflecting push and pull transaction rates along with associated trends reflecting delays associated with completion of those transactions. Visualization capabilities that enable SMC and LSM PMs to determine the state for each principal node of the EBnet are confirmed.

The SMC and LSM PMs monitors performance management information and use this to determine if transactions are submitted at rates faster than the ECS or applicable DAAC can handle. Also confirmed is the capability to determine if an ECS node exhibits saturation behaviors or unacceptable delays. Principal aspects of the system-wide and DAAC-specific load and throughput performance analysis are conducted for the SMC and each DAAC, respectively. The analysis determines if the ECS as a whole or a particular DAAC exhibits a maximum steady state throughput at which some resource, e.g., CPU execution time, channel transfer rates, disc access rates, or memory, is fully occupied. The SMC and LSM PMs perform short and long-term trend analysis of element performance, including operational status, performance of a particular resource, and maintenance activities.

The Site PM's analysis extends to the system software, hardware, personnel, and cost at each ECS site. The analysis also includes performance measurements of the ability to establish nominal operations, provide status information to SMC on request, and maintain processing capacity with reserves and expansion as required.

8.5.3.2 Test Case B080530.020-Network Performance Management

The Network Performance Management test case confirms the ability to evaluate the performance of network resources. At the LSMs, this ability is provided by the Performance Management Application Service of the network. At the SMC, it is provided by the Enterprise Monitoring and Coordination (EMC) Performance Management Application Service. Both support the routine gathering of statistical and historical data on the operational states of applications and systems resources, such as protocol stacks and EBnet equipment. Using the Performance Management Application Service, the LSM PM evaluates the data collected by comparing it with established criteria to measure the performance of a system and its components. Whereas, using the EMC Performance Management Application Service, the SMC PM obtains performance data collected system-wide by the various LSM Performance Management Application Services.

Using the Performance Management Application Service and the Test method to verify these requirements, the LSM PM benchmarks local trends. The LSM PM collects performance data on scientific algorithms and compares this information with established performance criteria. Periodically, performance summary reports from the DAACs and EOC are sent to the SMC.

Using the same input and test method as described above, the PM benchmarks system-wide trends based on the LSM data. The SMC PM evaluates this data to determine system-level performance and system-wide trends.

The outputs from this test are actual performance metrics and the performance summary report. This report is produced in three formats (console, disk, or printer). Each of these formats are compared for consistency.

8.5.3.3 Test Case B080530.030-Quality Assurance

Using the Analysis and Demonstration methods, the Quality Assurance (QA) test case verifies that ECS is capable of performing quality assurance activities. The QA Manager reviews the QA policies and procedures for accomplishing system-wide QA activities, which include the following items: quality assurance for the overall ECS performance; system-level quality testing, benchmarks, and audits for system enhancement implementations each of the sites; quality checking and audits of products processed and delivered; and quality testing and audits of site and element resource performance.

Using these policies, the site QA Manager reviews the performance of each site paying particular attention to center-specific criteria. At the SMC, the QA Manager pays particular attention to system-wide criteria. The QA Manager uses this information to evaluate the quality of simulated ingested data including reports and error logs. Specifically, data headers are examined for errors in data identification, data routing, data quality, sequencing of time-ordered data, data gaps, and data redundancy. The QA Manager performs actions necessary to reflect the appropriate quality assurance code in the product metadata.

The test inputs are the Quality Assurance policies and procedures and the simulated ingested data. The output from this test is a report evaluating the ability of ECS to provide Quality

Assurance in accordance with the ECS requirements reflecting any discrepancies between the actual performance and the policies.

8.6 Management Services Scenario

This scenario carries the site operations staff through the process of performing local system management. It traces the operations staff through the established procedures for system management and change. This scenario conducts the reviewers through the ECS capability for performing system level network, fault, and security management.

The ECS capability of providing, maintaining and updating a bulletin board service for publishing current ECS status, events, news and references and updates is evaluated. Functional capability for transmitting approved data and metadata formats and discipline related data types are assessed against in-project requirements related to data specifications.

This scenario carries the management staff through certain system fault detection and isolation instances, security monitoring episodes, and interface simulations. The ECS fault management scenario also evaluates ECS capability for performing system level fault analysis and for performing system fault diagnostic testing, fault resolution, and recovery actions. SMC integrated system level fault management database structure and procedures are analyzed against stated requirements and the LSM capability for contributing to, receiving from, and implementing fault system database directives and information. The SMC's capability for acquiring or developing and maintaining fault management tools and the overall quality of the SMC fault management plus user access procedures to the is evaluated.

LSM procedures for monitoring and assessing in-site security procedures are evaluated as well as their ability to receive SMC originated system security information and directives and to communicate in-site security status and events. SMC security evaluations include assessments of their ability to manage the system level security process, including network security and risk analysis. In addition to security management, the AT team evaluates system level security functionality, especially network security functions and those activities related to inter-site data and information exchange. SMC provisions for user profile access security are evaluated.

8.6.1 Network Management Sequence

In this sequence, network architecture as-built specifications are inspected to confirm that they are consistent with the architecture defined in the OSI Management Framework (ISO 7498-4), and the OSI Systems Management Overview (ISO DIS 10040). ECS network procedures to ensure that the network operates in a manner that is transparent to the user are inspected including evaluations to ensure provision of ISO/OSI data communications protocols and support for TCP/IP communications protocols and services to external interfaces in response to approved IRDs. The methodology for managing internetwork services are inspected for content of, protocol, translation, termination, bridging and routing functions extending to file transfer functions. Procedures for interoperability with the NSI and other external sites to provide user access to the ECS are inspected as required for Release B.

This sequence provides the methodology for reviewer inspection of ECS network capabilities for controlling and monitoring network systems. The reviewer methodology includes inspection of network status and statistics capabilities.

This sequence confirms the existence of a network help desk, which provides overall user support of the ECS system including working with users in solving user problems. Also confirmed in this sequence is the ability of the existence of management function capabilities at each ECS site or gateway as well as a fully automated bulletin board system.

8.6.1.1 Test Case B080610.010-Network Interface Status

The Network Status test case confirms the ability of the SMC and LSM Network Analyst (NA) to obtain information on the network configuration and network resource status using the Test method. This test also verifies the ability of the SMC and LSM to perform configuration management functions which exercise control over the network configuration, parameters, and resources.

The management product used by the ECS project, HP Open View, employs the simple network management protocol (SNMP). SNMP products include features, commands and services to access information pertaining the status of network resources. Using the management product's SNMP abilities, the NA collect, control collection of, store, and display network statistics. The Test method is used to verify the requirements.

From the SMC, the NA tests these functions from a central monitoring and coordination node providing system-wide capabilities. On these nodes where the management services reside, such as SNMP, are the configuration management functions. At the LSM, the NA tests these functions from a major service provider site's (currently the DAACs and the EOC) LSM department. These LSMs contain federated, autonomous nodes where the local management services, such as SNMP, reside. These nodes provide configuration management functions for managing each site's resources.

The NA conducts the configuration management functions for controlling local and system-wide network configuration, parameters and resources, such as bootstrap, and backups. Also tested are the configuration management functions for displaying, monitoring, capturing and maintaining status on network resources. This information is stored in the SNMP management information base (MIB). The MIB is accessible to the SMC and the LSMs across the network. A detailed report on the functionality of the SNMP management product is the output for this test. The output for this test also includes the contents of the SNMP MIB.

8.6.1.2 Test Case B080610.020-Help Service

The Help Service test case is evaluated using the Demonstration and Inspection methods. The objective of this test is to evaluate the ability of the Help Service to assist users with communications questions and problems. SDPS services offers a set of interfaces which allow the user interface help services of the client subsystem to obtain help data for display to the user. The help data is installed on the user interface platform or is dynamically requested by the user interface software in response to a user action.

Using a communication question or problem as input, the ECS user accesses, by dynamic request, the help service concerning the problem communications issue. The ECS user then evaluates the information as to its effectiveness in solving this problem. Also, the interface is evaluated to verify the existence of context-sensitive help features in the interface. The expected results for this test is the successful resolution of the problem through the use of the Help Service's user-friendly interface.

8.6.1.3 Test Case B080610.030-Data Flow and Directory Service

The purpose of the Data Flow and Directory Service test case is to evaluate the functionality of the Directory/Naming Service. The Directory/Naming Service is one of the fundamental facilities needed in distributed environments to uniquely associate a name with resources/principals, either physical or logical, along with some information. They are identified and located by this name even in the event that the named resource changes its physical address over time. The ECS requires the Directory/Naming Service to provide this functionality as well as directory access control capabilities. These access control capabilities include the capability of a support mechanism to authenticate the credentials of a user for the purpose of granting access rights.

Using the Analysis and Test methods at each site, the SA stores and retrieves any general information, the test input, that is required to be made available about an object across the network. This information includes a server's (an ECS search program that is going to search the databases for a specified criterion) binding information, fileset (a file containing the atmospheric conditions for a specific time) locations, SDPS product type (MODIS 2B), and a resource's (a printer) location in a network. The expected results for this test is the successful completion of name-to-attribute mapping, gaining access to authorized network resources, and system response to requests for information.

8.6.1.4 Test Case B080610.040-Electronic Messaging/Bulletin Board

The Demonstration, Inspection, and Test methods are employed to confirm the Electronic Messaging/Bulletin Board test case. This test confirms the ability of the ECS network to provide the Electronic Messaging and Bulletin Board Services to each ECS site. The Electronic Messaging Service provides the capability to manage electronic mail messages to its users and applications. The service also provides application programming interface (API) which has limited capabilities as compared to the interactive portion of the service. Only sending of messages is allowed by the interface. The Bulletin Board Service consists of multiple bulletin boards. The Mail Administrator (MA), who maintains this service, post information that relates to ECS services, products, status, events, and news for ECS users.

This test demonstrates the capability of the electronic message function to exchange messages across external mail systems based on SMTP and X.400 protocols, by sending and receiving the Multi-purpose Internet Mail Extension (MIME) messages available at GSFC, which supports X.400 operations. The test inputs for this test are two pair of mail accounts (mailbox) and two simple mail messages (a message and a reply). The MA creates and sends a mail message from the source mail account. Upon receipt at the destination account, another MA creates and sends

a reply message. The expected results of this test include successful message transfers across the external mail system.

Once logged into E-mail, the MA accesses moderated and non-moderated bulletin boards. Within E-Mail, the Mail Administer tests the capability for users to either subscribe or unsubscribe to any bulletin boards. Once subscribed, the MA tests the capability of selecting a subscribed bulletin board for viewing all messages in that bulletin board. The capability of the bulletin board to respond to a message by sending the response to the bulletin board and/or author is also tested.

8.6.2 Fault Management Sequence

This sequence conducts the evaluator through inspections and demonstrations of the ECS capability to detect system and site level faults and to analyze fault conditions, perform diagnostic testing, correct and recover from faults (or execute suitable contingency actions). The site operations teams confirm the capability of the system and each site to recover from global faults such as system failures, global data losses, or catastrophic security violations as well as local fault conditions as required in Release B.

The each site's, including the SMC's, personnel capabilities and test tools for isolating, locating, identifying and analyzing faults at the system and site level (except for flight operations faults) are confirmed. SMC and site capabilities for performing fault diagnostic testing are confirmed and evaluated for the ability to react efficiently to testing specific fault situations. The SMC's and each LSM's capability for recovering from fault situations is evaluated during previous shutdown and recovery demonstrations, plus an inspection of recovery policy and procedures, and typical operations response times for recovering from fault situations.

8.6.2.1 Test Case B080620.010-Fault Detection, Isolation, and Analysis

The objective of the Fault Detection, Isolation, and Analysis test case is to verify that each ECS site has the capacity to detect, locate, isolate, identify and analyze ECS system faults. This test also verifies the SMC capability to ingest fault data from sites and perform system-wide fault analysis except for faults directly related to flight operations.

Using simulated fault situations (such as non-compliance of on-demand or scheduled data request event) covering both the system-wide and site level faults, the RM discovers a fault while monitoring the system. The RM investigates further using ECS tools and COTS packages, which give him/her further details on the fault (location and description). The RM opens a Trouble Ticket (TT) into the ECS Trouble Ticketing System. The RM, in conjunction with the Operations Supervisor (OS) diagnoses the problem further. The RM and OS make the required modification and restart the system resources effected. The RM updates the TT with the resolution and closes the TT.

The outputs from these test executions are the system logs products and reports related to system functions and performance as a result of imposing the simulated fault conditions. An output report based on observations and comparison of system outputs with expected results, is

generated, that assesses the ECS capability for detecting, isolating, and analyzing fault conditions.

8.6.2.2 Test Case B080620.020-Network Fault Management

The Network Fault Management test verifies the ECS network's ability to detect, diagnose, analyze, and report network faults and errors at each ECS site. This ability is provided by the Fault Management Application Service of the network. The Fault Management Application Service supports the routine gathering of statistical and historical data on the errors and fault events. Furthermore, the Fault Management Application Service encompasses activities such as the ability to trace faults through the system. Also, it supports the use and management of error logs. This test case uses the Analysis, Inspection, and Test methods.

Using a simulated network fault (e.g. configuration errors, protocol errors, communications hardware errors, performance degradation conditions, and telecommunications errors and failures) as input for this test, the RM monitors the ECS network and receives an fault indicator. Detection occurs due to the Fault Management Application Service reporting the information in the form of console display messages and storing it in the error logs. Upon detection, the RM opens a TT describing the fault. The RM isolates and tests the fault event using the service's diagnostic utilities, including packet tracing, traffic modeling and network simulation utilities. The diagnosis and isolation of a fault involves determining the cause from the reported systems, using the diagnostic tests where applicable. Once identified, the RM uses the service's analysis function to determines the corrective action to restore the system to normal operational status. In the event the corrective action requires a change to the configured software, the RM refers the problem to Sustaining Engineering (SE). SE investigates and initiates the Configuration Change Report (CCR) process. SE informs the RM upon correcting and testing the problem with the software. The SE changes the software configuration and closes the TT.

After error recovery, a summary report of the fault event is sent to the SMC. Fault data summary reports can be generated on a periodic as well as interactive basis. A scheduled production of the report is generated for verification. Summary reports contain information on various fault events, such as network reset and restart indications, network round trip delay, outages and CRC errors.

8.6.3 Security Management Sequence

This sequence provides the reviewer guidance in inspecting and confirming ECS capabilities for establishing and maintaining security management databases, and for managing system and site level security methods for the entire ECS. An AT review of security management capabilities largely consists of evaluations of each site's ability to manage, maintain and requisition security testing, such as password checking and control of ECS and internal privileges at each Release B site.

The AT team inspects the combined SMC and LSM system and site level physical security password management, operational security, data security, privileges, network security and security compromise mitigation procedures. The ability of the ECS to establish, maintain and authenticate access privileges for ECS scientific users are evaluated by the site M&O team. The

ability of the ECS to perform system level security and LSM analyses and compromise detection procedures, as well as encrypted information management tasks are inspected. The existence of, and response to specific requirements for, countermeasures to specified security threats is inspected.

The test team evaluates the ability of ECS to detect and control unauthorized access and abuse of ECS networks followed by demonstrations of these capabilities in an operational environment. ECS access is inspected for confirmation of secure procedures. The adequacy of the authentication, access control authorization, data integrity and data confidentiality processes is assessed. Management of security events including event detection, reporting and logging is inspected. Furthermore, this conducts the reviewer through an inspection of security related tool kits used to perform security related functions at the ECS system and site levels.

8.6.3.1 Test Case B080630.010-User Access Security

The User Access Security test case uses the Demonstration and Test methods to verify the ECS ability to control user access and prevent data corruption resulting from unauthorized access. Test inputs include the ECS Security Management Application and authorized user account request.

Using the ECS Security Management Application at each site, the SA creates a new user account for the authorized request configuring it as directed in the authorization. The new user logs in and tests the authorized abilities of the account to access ECS databases. After gaining knowledge of this account, a "hacker" attempts to log in by guessing its password. After three unsuccessful attempt on this host, the "hacker" is locked out and proceeds to attempt access from another host. After each failed attempt, the ECS Security Management Application logs the event to the security audit log.

Test case outputs include the audit trail maintained in the security logs. This audit trail is evaluated to verify the inclusion of user/process/element access to ECS security controlled data, unsuccessful attempts by unauthorized users, and Test case outputs include evaluations that confirm the new users ability to access his/her account, intrusion detection and reporting, and demonstration results, or the evaluation lists noted discrepancies.

8.6.3.2 Test Case B080630.020-SMC/LSM Security Functions

The SMC/LSM Security Functions test case verifies the ability of the SMC and LSM Security Managers to establish, maintain, and authenticate access privileges for ECS users. Inputs to this test case include specifications of the following SMC security functions to include: procedures and methodology for establishing maintaining, and authenticating ECS access privileges for the ECS scientific users; procedures for managing, maintaining, and requesting site security testing such as password checking and site internal privileges control; performing compromise detection and security risk analyses; initiating recovery procedures in response to a detected security compromises; and managing encrypted information, including keys. The Analysis, Demonstration, Inspection, and Test methods are used to verify this test case.

A "hacker" attempts to log in to an ECS host from a SCF campus by guessing passwords. After the number of unauthorized attempts has exceeded the established thresholds, the ECS Security Management Application logs the event to the security audit log. While monitoring the system, the SA discovers the attempted breach of security in the log. The SA informs the LSM Security Analyst of the situation. After verifying the information, the LSM Security Analyst informs the SMC Security Analyst who forwards a security advisory to each of the site LSM Security Analysts. Based on this advisory, the site LSM Security Analysts monitor the incoming accesses from the host in question. The LSM Security Analyst at the site in question begins a thorough investigation. The SMC Security Analyst coordinates its investigation and findings with the LSM Security Analyst.

Test case outputs include an inspection of the security logs and audit trails. Also included as output is a detailed report documenting the investigation and its findings including any countermeasures against the offender as well as those configured into the system. An evaluation of the security personnel's demonstration results noting any discrepancies is also included.

8.7 Ancillary Services Scenario

This scenario takes site management personnel through a series of cases involving the use of system services in the management of the ECS at the SMC, EOC and each DAAC. The ECS capability for collecting, controlling, maintaining and distributing ECS system level policies and procedures is evaluated. The completeness and effectiveness of the refined ECS policies are assessed. The ability of the SMC to coordinate its efforts with the site LSM staffs is evaluated. LSM procedures are evaluated as well as the LSM's proficiency in receiving SMC originated system security information and directives and the LSM's ability to communicate in-site status and events.

Evaluation of ECS accounting and accountability activities extends to both the SMC performed system functions and LSM in-site functions. The completeness and effectiveness of related data collection, analysis and reporting activities is assessed, by comparison with ECS management and administrative requirements, in particular the schedules and content of required reports.

Evaluation of ECS report generation capabilities extends to evaluating the capability for providing required reports specified by the services referenced in the system management scenario group as well as evaluation of the capability for reporting integrated database summary information such as the allocation of ground segment functions to the sites, and system user and supplier directories.

8.7.1 Accounting and Accountability Sequence

This sequence guides the evaluator through an assessment of the ECS and site capability to perform compliant accounting and accountability functions. The SMC database for supporting, maintaining and updating accounting and accountability tasks is inspected for agreement with Release B requirements. The SMC's ability to establish, maintain, and update data tracking systems to track data transport from ECS input to ECS output, and to allow statusing of all product-production activities is confirmed by inspection of outputs. The SMC capability to calculate the resource unit costs associated with processing information from system input to

system output is similarly confirmed as is SMC's ability to establish, maintain and update resource usage information for individuals, groups and processes. Furthermore, in this sequence, the AT team confirms the availability of an automated accounting system which provides accounting statistics, such as media, personnel, and network cost.

8.7.1.1 Test Case B080710.010-SMC/LSM Accountability Tracking

The SMC/LSM Accountability Tracking test case is applied to each site except SEDAC. This test case verifies SMC's ability to perform configuration accountability. This test case also verifies the ability of the LSM SAs to track and audit configuration accountability of ECS hardware and software. The Demonstration method is used to verify the SMC and LSM accountability requirements.

Using ECS user accounts as input for test, on-site and off-site users log into multiple sites of ECS data (MODIS, CERES). Then, the user retrieves the data. The user manually tracks the data type and site of the retrieval. Once the user finishes retrieving the various ECS databases, the LSM SA prints out an audit trail for the user's account as well as the an audit trail for the data. The LSM SA analyzes and compares this information with that provided manually from the user. The output from this test is a report evaluating the ability of ECS to provide LSM accountability tracking in accordance with the ECS requirements reflecting any discrepancies between the actual usage and the audit report.

The LSM SA forwards this report to the SMC SA who maintains the data tracking systems. The SMC SA analyzes the data base and updates the system based on the LSM SA's report.

8.7.1.2 Test Case B080710.020-SMC/LSM Accounting Tracking

The SMC/LSM Accounting Tracking test case verifies the SMC and LSM SA's ability to track ECS resource usage, update user account information, and dispose of accounting functions (accounts payable, accounts receivable) for ECS services. This test case also verifies the ability of the SMC and LSM SAs to generate invoices reflecting the accounting usage, information, and functions. The Demonstration and Test methods are used to verify the accounting requirements.

The SAs calculate resource unit costs based on ESDIS project authorized billing algorithms and rates associated with the processing of information from system input to system output. Upon completion of the calculations, the SAs update the resource utilization account information the system uses to generate billing information. The SMC Accounting Analysts generate individual and group invoices as scheduled based on the new information and distribute the bills. The SMC Accounting Analysts perform accounts payable and accounts receivable functions related to the current billing cycle.

Test case output is an evaluation that confirms that the SMC and LSM audit and tracking procedures adhere to ECS requirements insofar as these standards are applicable to the SMC and LSM configuration. If this is not the case, deviations are noted in the evaluation report.

8.7.2 Report Generation Sequence

This sequence guides the evaluator in assessing ECS capability for performing site specific report generation required for Release B. The report generators at each site are evaluated through inspection of output products and comparison of the products against site reporting requirements. The ability of the report generators to generate various reports, such as accounting, security audit, fault and recovery logs, and resource inventories, is verified.

8.7.2.1 Test Case B080720.010-SMC Report Generation

The SMC Report Generation test case demonstrates to SMC System Engineers the existence and capabilities of a generalized report generator residing within the SMC site configuration. The Analysis, Demonstration and Test methods are used to verify the report generation requirements in this test case. Test case inputs include the as-built report generator specifications. Initial test conditions require a fully operational SMC computer configuration including the generalized report generator and input data sets that are representative of the full range of system-wide data types that are operated on by the SMC report generator.

Test execution consists of the SMC System Engineers performing all steps involved in producing standard or customized SMC reports through use of the generalized report generator from user request through output to selected media. The process is evaluated for effectiveness of input specifications to the report generator and flexibility of receiving inputs as well as directing outputs to various media and devices. Each of the report demonstrations is evaluated for adherence to report format and content specifications. Output formats are evaluated for correctness as well as readability and satisfactory presentation. The report generator is also evaluated for it's capability to customize output reports, from data previously captured in a management DBMS, including all or portions of the system and variable amounts of time.

Evaluated report capabilities include generation of: a functional allocation report giving the current allocation of ground segment functions; summary and detailed configuration status reports; summary training reports; hardware, system and scientific software inventory reports; spares and consumables reports; lists of proposed enhancements; detailed and summary reports indicating the overall performance of the ECS; product generation status reports; ground resources performance reports; user feedback analysis reports; fault management reports; detailed and summary maintenance schedule; security compromise reports; and proposed enhancement reports.

Test outputs include completed demonstration reports that compare expected versus actual outputs. General comments and recommendations concerning report formats customization capabilities and timeliness of report generation of the ECS; product generation status reports; ground resources performance reports; user feedback analysis reports; fault management reports; and security compromise reports.

8.7.2.2 Test Case B080720.020-LSM Report Generation

The LSM Report Generation test case verifies the existence and capabilities of a generalized report generator residing within the EOC and each DAAC configuration. The Analysis,

Demonstration, Inspection and Test methods are used to verify the report generation requirements in this test case.

Test case inputs include the as-built report generator specifications. Initial test conditions require a fully operational computer configuration including the generalized report generator and input data sets that are representative of the full range of site data types. Test execution consists of the LSM System Engineers performing all steps involved in producing standard or customized LSM reports through use of the generalized report generator from user request through output to selected media.

The process is evaluated for effectiveness of input specifications to the report generator and flexibility of receiving inputs as well as directing outputs to various media and devices. Each of the report demonstrations is evaluated for adherence to report format and content specifications. Output formats are evaluated for correctness as well as readability and satisfactory presentation. Evaluated report capabilities for the LSM report generator are the same as those evaluated for the SMC report generator listed in 8.7.2.1 "SMC Report Generation", except that the information covered in the reports is limited to the LSM's particular site.

Test outputs include completed demonstration reports that compare expected versus actual outputs. General comments and recommendations concerning report formats customization capabilities and timeliness of report generation of the ECS; product/data generation status reports; ground resources performance reports; user feedback analysis reports; fault management reports; and security compromise reports.

8.7.3 Policies and Procedures Management Sequence

This sequence conducts the review through an inspection of ECS/SMC/LSM procedures and policies for supporting, controlling and maintaining ECS policies and procedures covering site responsibility and authority, resource management, fault recovery, testing, simulation, maintenance, logistics, performance evaluation, training, quality and product issuance, inventory management, system enhancements, finance management, and administrative actions. Appropriate LSM implementation actions and security are inspected and confirmed. SMC procedures for posting and keeping current ECS status, events and news items through use of the ECS bulletin board service as well as inclusion of updates and other information concerning SMC contents and updates and references to changes and updates to scientific information, are inspected and confirmed.

8.7.3.1 Test Case B080730.010-Policies and Procedures Control

The Policies and Procedure Control test case verifies the overall support and control of policies and procedures affecting the ECS. It applies to the SMC, EOC, and the each DAAC except SEDAC.

This test case confirms that the SMC receives system-level policies from ESDIS, that these policies as well as procedures and guidelines are incorporated into SMC directives, and that these directives are disseminated to the DAACs, the EOC, and supporting sites as required. It verifies that principal ECS operational functions at the DAACs, EOC, and SMC are provided for in the

management and control of ESDIS/ECS policies and procedures. It also confirms that the SMC and LSM uses methods and procedures appropriate for controlling policies and procedures as well as pertinent correspondence at a system-wide and site level, respectively.

In this test case, the SMC and LSM M&O staffs, as appropriate, establish mechanisms and management processes for control of the following categories of ECS/ESDIS policy information: ECS and site-level responsibility and authority, resource management, fault recovery, testing, simulation, maintenance, logistics, performance evaluation, training, quality and product assurance, inventory management, system enhancements, finance management, administrative actions, and ECS security. The SMC and LSM M&O staffs use the Analysis, Demonstration, Inspection, Test Methods to verify the policies and procedures requirements.

SMC and LSM M&O staffs post policies and procedures information to a bulletin board containing ECS status, events, and news so that ESDIS, SMC, and LSM policies, procedures and directives can be properly maintained and distributed. Access to updating this information is limited to specified personnel with the proper ECS responsibility and authority.

The SMC and LSM M&O staffs records any deficiencies or discrepancies regarding SMC and LSM policies and procedures control. The SMC and LSM M&O staffs also evaluates the capability of the SMC and LSM staffs to provide, via the ECS bulletin board service, a consisting of a list of approved CASE tools and references to standards for exchanging data for science use.

This page intentionally left blank

409-CD-002-001